

**PERCEPTIONS AND EXPERIENCES OF HEALTH PROFESSIONALS  
REGARDING CONSERVATIVE MANAGEMENT OF OSTEOARTHRITIS AT A  
TERTIARY HOSPITAL IN NIGERIA**

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**A thesis submitted in partial fulfilment of the requirements for the degree of  
Master's Degree of Science in Physiotherapy, Faculty of Community and Health Sciences,  
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## **KEYWORDS**

**Osteoarthritis**

**Conservative Management**

**Health Professionals**

**Perception**

**Experiences**

**Physiotherapy**



## ABSTRACT

Osteoarthritis (OA) is the major cause of pain and disability in the elderly, as well as people younger than the age of 45. Research reported the importance of conservative management of OA in the early stages, as it has proved to be effective in slowing down the progression of the disease, as well as reducing the secondary effects of decreased functional ability and disability. Early referral could assist with effective pain management, decrease in disease progression and increase in functional ability and quality of life. Therefore, the overall aim of the study was to establish a profile of patients with OA, as well as to explore the perceptions and experiences of health professionals regarding the conservative management of OA at a tertiary hospital in Nigeria. The study employed a sequential exploratory mixed method approach, using a retrospective and exploratory study design for the quantitative and qualitative phases respectively. Data was collected from one hundred and thirty-five medical records of patients with OA, meeting the inclusion criteria of the study, and admitted at the University of Calabar Teaching Hospital (UCTH) from 1 January 2012 to 31 December 2016. The patient sample was predominantly female ( $n=80$ ; 93%), with a mean age of 51.85 years old ( $SD=13.73$ ). Thirteen (13) health professionals, eight (8) physiotherapists and five (5) orthopedic surgeons participated in the interviews. The Statistical Package for Social Sciences (SPSS) version 24 was used to analyse quantitative data. Inferential and descriptive statistics were used to describe the results in terms of frequencies, percentages, means and standard deviation. Alpha level was set at 5%. Audio-taped qualitative data was transcribed verbatim, and analysed using categories and themes. Permission to conduct the study was obtained from the University of the Western Cape Biomedical Research Ethics Committee (BMREC). Informed written consent was obtained from each participant. Confidentiality and the right to withdraw from the study were explained to all the participants. Pharmacological intervention (75.6%) was the choice of treatment mainly used by the orthopedic

Surgeons followed by conservative management (19.3%) and surgery (5.2%). Referral of patients with OA for conservative management was very poor. Therefore, physiotherapists are not readily involved in the management of patient with OA in the early stages of the condition. The interviews of health professionals involved in the management of OA at UCTH raised contradictory perceptions. The physiotherapists perceived the conservative management of OA to be inadequate, with room for improvement, while the orthopedic surgeons perceive the conservative management to be optimal and very good. Both health professional (physiotherapists & orthopedic surgeons) domains reported that physiotherapists are important team members and provide effective treatment for patients with OA. In addition, physiotherapists reported late referrals, unavailability of resources and non-adherence to treatment as major challenges in the management of patients with OA, while the orthopedic surgeons reported non-compliance with drug regime and cost of surgery as challenges. The results show that awareness regarding the importance of conservative management should be strongly advocated amongst health professionals involved in the management of OA. Results from the present study showed that orthopedic surgeons involved in the management of OA have very little knowledge of the role physiotherapists can play in the conservative management of patients with OA. This could explain the tendency of poor referral of patients with OA for conservative management. Early referral could reduce the secondary effects of OA and increase the functional ability and health-related quality of life of patients with OA.

## DECLARATION

I declare that ‘**Perceptions and experiences of health professionals regarding conservative management of osteoarthritis at a tertiary hospital in Nigeria**’ is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references. Finally, this work has been prepared in accordance with the guidelines of the University of the Western Cape.

**OBINWAKEZE, ChidimmaOluchukwu**

**NOVEMBER2018**



Signature.....

WITNESS:

Signature -----

**Dr.Tania Steyl(Supervisor)**

## DEDICATION

I dedicate this thesis to my loving husband, Onyekachi, and beautiful daughter, Michelle, for being a pillar of strength in my life.



## ACKNOWLEDGEMENTS

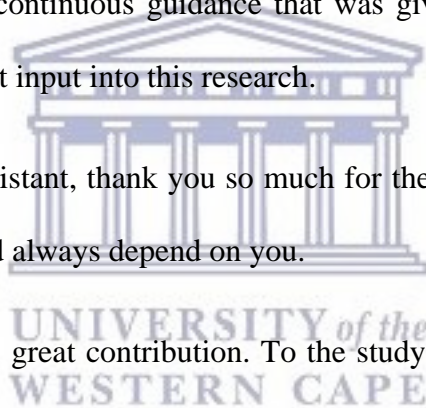
I would like firstly to honour God for providing me with courage when the road to completion seemed out of sight, determination throughout all challenges, energy when the task seemed inexhaustible and endurance to chisel away daily while molding this piece of work.

My husband Onyekachi, my baby Michelle, thank you for all the optimism, endless supply of support at any hour of the day and night, advice, financial support, for driving me to and from school at any scheduled time, and for the endless amount of care and non-waning support.

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## LIST OF APPENDICES

**Appendix A:** Ethics approval from UWC Senate Research Committee

**Appendix B:** Ethics approval letter from the University of Calabar Teaching Hospital

**Appendix C:** Interview guide

**Appendix D:** Information sheet

**Appendix E:** Informed consent form

**Appendix F:** Data gathering instrument

**Appendix H:** List of codes





## LIST OF FIGURES

<b>Figure 2.1</b>	Summary of therapeutic options in OA management.....	32
<b>Figure 2.2</b>	The Public Health Approach Model.....	42
<b>Figure 3.1</b>	Research approach.....	45
<b>Figure 4.1</b>	Types of treatment for patients with OA.....	56



## LIST OF TABLES

<b>Table 4.1</b>	Demographic characteristics of patients with OA at a tertiary hospital in Nigeria.....	56
<b>Table 4.2</b>	Treatment types and gender of the study samples.....	57
<b>Table 4.3</b>	Functional status and type of treatment received of the study sample.....	58
<b>Table 4.4</b>	Functional status and gender of the study sample.....	59
<b>Table 4.5</b>	Physiotherapy management of the study sample for period 2012-2016.....	60



## TABLE OF CONTENTS

KEY WORDS .....	ii
ABSTRACT.....	iii
DECLARATION.....	v
DEDICATION .....	vi
ACKNOWLEDGEMENT .....	vii
LIST OF APPENDICES .....	viii
LIST OF FIGURES .....	ix
LIST OF TABLES .....	x

## CHAPTER ONE: INTRODUCTION

1.1 INTRODUCTION .....	1
1.2 BACKGROUND OF THE STUDY .....	1
1.3 PROBLEM STATEMENT .....	4
1.4 RESEARCH QUESTIONS.....	5
1.5 AIM OF THE STUDY .....	5
1.6 OBJECTIVES OF THE STUDY.....	5
1.7 SIGNIFICANCE OF THE STUDY.....	5
1.8 DEFINITION OF KEY TERMS .....	6
1.9 ABBREVIATIONS.....	7
1.10 OUTLINE OF THE CHAPTERS .....	8

## CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION.....	11
2.2 PREVALENCE OF OSTEOARTHRITIS.....	11
2.3 PATHOLOGY AND EPIDEMIOLOGY OF OSTEOARTHRITIS.....	13

2.4 THE IMPACT OF OSTEOARTHRITIS.....	14
2.5 SIGNS AND SYMPTOMS OF OSTEOARTHRITIS.....	18
2.5.1 Joint pain .....	18
2.5.2 Joint stiffness .....	19
2.5.3 Joint instability .....	20
2.5.4 Crepitus .....	20
2.5.5 Restricted joint motion .....	21
2.5.6 Bony changes and joint deformity .....	21
2.5.7 Joint tenderness .....	21
2.5.8 Inflammation .....	22
2.5.9 Muscle atrophy .....	22
2.6 RISK FACTORS FOR THE DEVELOPMENT OF OSTEOARTHRITIS.....	23
2.6.1 Age .....	23
2.6.2 Gender .....	23
2.6.3 Ethnicity .....	24
2.6.4 Hormonal status .....	24
2.6.5 Nutritional factors.....	24
2.6.6 Bone density .....	25
2.6.7 Genetic factors .....	25
2.6.8 Obesity and overweight .....	26
2.6.9 Occupational risk factors.....	27
2.7 PREVENTION OF OSTEOARTHRITIS.....	28
2.7.1 Primary prevention .....	28
2.7.2 Secondary prevention .....	29
2.7.3 Tertiary prevention .....	29
2.8 MANAGEMENT OF OSTEOARTHRITIS .....	30



2.8.1 Education on osteoarthritis .....	31
2.8.2 Exercise .....	32
2.8.3 Weight reduction .....	36
2.8.4 Manual therapy and joint manipulation .....	37
2.8.5 Bracing and footwear .....	39
2.9 CONCEPTUAL FRAMEWORK OF THE STUDY.....	39
2.10 SUMMARY OF THE CHAPTER .....	40

### **CHAPTER THREE: METHODOLOGY**

3.1 INTRODUCTION .....	42
3.2 RESEARCH SETTING.....	42
3.3 RESEARCH APPROACH.....	42
3.4 QUANTITATIVE PHASE OF THE STUDY.....	43
3.4.1 Study design.....	43
3.4.2 Population and sampling.....	44
3.4.3 Data collection instrument.....	44
3.4.4 Reliability and Validity.....	45
3.4.5 Data collection procedure.....	46
3.4.6 Data analysis .....	47
3.5 QUALITATIVE PHASE OF THE STUDY	
3.5.1 Study design.....	47
3.5.2 Population and sampling .....	47
3.5.3 Data collection tool.....	48
3.5.4 Trustworthiness.....	49
3.5.5 Data analysis .....	50
3.6 ETHICS CONSIDERATIONS .....	50

3.7 SUMMARY OF THE CHAPTER .....	51
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## **CHAPTER FOUR: QUANTITATIVE RESULTS**

4.1 INTRODUCTION.....	52
4.2 DEMOGRAPHIC CHARACTERISTICS OF THE STUDY SAMPLE.....	52
4.3 MANAGEMENT OF OSTEOARTHRITIS OF THE STUDY SAMPLE.....	54
4.4 FUNCTIONAL STATUS OF THE STUDY SAMPLE .....	55
4.4.1 Functional status and gender.....	57
4.5 PHYSIOTHERAPY INTERVENTION EMPLOYED IN THE MANAGEMENT OF THE STUDY SAMPLE.....	57
4.6 SUMMARY OF CHAPTER.....	58

## **CHAPTER FIVE: QUALITATIVE RESULT**

5.1 INTRODUCTION .....	60
5.2 DESCRIPTION OF THE PARTICIPANTS .....	60
5.3 PERCEPTION OF PHYSIOTHERAPISTS REGARDING THE MANAGEMENT OF OSTEOARTHRITIS AT THE HEALTH CARE FACILITY.....	61
5.3.1 Inadequate Management of OA.....	61
5.3.2 Prompt referral for physiotherapy .....	62
5.3.3 Need for improvement .....	63
5.4 PERCEPTIONS OF ORTHOPEDIC SURGEONS REGARDING THE MANAGEMENT OF OSTEOARTHRITIS AT THE HEALTH CARE FACILITY.....	64
5.4.1 Management of OA.....	64
5.4.2 Barriers to OA management.....	65
5.4.3 Need for improvement in the management of OA.....	66

5.5 PERCEPTIONS OF HEALTH PROFESSIONALS REGARDING THE CONSERVATIVE MANAGEMENT OF OSTEOARTHRITIS .....	67
5.5.1 Severity of the condition.....	67
5.6 PERCEPTION OF HEALTH PROFESSIONALS REGARDING THE ROLE OF PHYSIOTHERAPISTS IN THE MANAGEMENT OF OSTEOARTHRITIS.....	68
5.6.1 Assessment .....	68
5.6.2 Treatment .....	69
5.6.3 Health promotion .....	70
5.6.4 Prevention.....	71
5.7 EXPERIENCES OF HEALTH PROFESSIONALS REGARDING THE ROLE OF PHYSIOTHERAPY IN THE MANAGEMENT OF OSTEOARTHRITIS .....	73
5.7.1 Effectiveness of physiotherapy .....	73
5.7.2 Important team member .....	74
5.8 CHALLENGES ENCOUNTERED BY HEALTH PROFESSIONALS WHEN MANAGING PATIENTS WITH OSTEOARTHRITIS.....	74
<i>PHYSIOTHERAPISTS</i>	
5.8.1 Late referral .....	75
5.8.2 Unavailability of resources .....	76
5.8.3 Non-adherence to treatment .....	78
<i>ORTHOPAEDIC SURGEONS</i>	
a) Non-compliance to medicine.....	80
b) Cost of surgery.....	81
5.9 SUMMARY OF THE CHAPTER.....	81
 <b>CHAPTER SIX: DISCUSSION</b>	
6.1 INTRODUCTION.....	83

6.2 PREVALENCE OF OSTEOARTHRITIS AS IT RELATES TO GENDER AND FUNCTIONAL STATUS.....	83
6.3 TYPE OF TREATMENT RECEIVED BY PATIENTS WITH OSTEOARTHRITIS.....	84
6.4 PERCEPTIONS OF HEALTH PROFESSIONALS REGARDING OSTEOARTHRITIS MANAGEMENT AT THEIR HEALTH CARE FACILITY .....	85
6.5 PERCEPTION OF HEALTH PROFESSIONALS REGARDING CONSERVATIVE MANAGEMENT OF OSTEOARTHRITIS.....	86
6.6 PERCEPTIONS OF HEALTH PROFESSIONALS REGARDING THE ROLE OF PHYSIOTHERAPISTS IN THE MANAGEMENT OF OSTEOARTHRITIS.....	86
6.6.1 Assessment.....	87
6.6.2 Treatment.....	88
6.6.3 Health promotion .....	90
6.6.4 Prevention.....	90
6.7 EXPERIENCES OF HEALTH PROFESSIONALS REGARDING THE ROLE OF PHYSIOTHERAPISTS IN THE MANAGEMENT OF OSTEOARTHRITIS.....	91
6.8 CHALLENGES ENCOUNTERED BY HEALTH PROFESSIONALS WHEN MANAGING PATIENTS WITH OSTEOARTHRITIS .....	92
6.8.1 Late referral.....	93
6.8.2 Availability of resources.....	93
6.8.3 Adherence to treatment.....	94
6.9 SUMMARY OF THE CHAPTER .....	96

## **CHAPTER SEVEN: CONCLUSIONS LIMITATIONS AND RECOMMENDATIONS**

7.1 INTRODUCTION .....	97
7.2 SUMMARY OF THE STUDY .....	97
7.3 LIMITATIONS OF THE STUDY.....	99



7.4 RECOMMENDATIONS.....	99
7.5 CONCLUSION .....	101
7.6 SUMMARY OF THE CHAPTER .....	101
REFERENCES .....	102



# **CHAPTER ONE**

## **INTRODUCTION**

### **1. INTRODUCTION**

This chapter provides information on osteoarthritis, its impact worldwide and the management of the disease. It further describes management options for osteoarthritis, with a focus on conservative management, and the prevalence of osteoarthritis in Nigeria. The statement of the problem, research question, aims and objectives are stated. Thereafter, the chapter ends with abbreviations, a description of the definitions of terms used and a summary of the chapters of the thesis.

#### **1.1 BACKGROUND**

Osteoarthritis (OA) is a common joint disease that most often affects middle aged to elderly people (Messier, Loeser, Miller, Morgan, Rejeski & Sevick et al., 2004). It is a slowly progressive disease characterised by breakdown of the cartilage, bony changes of the joints, deterioration of tendons and ligaments and various degrees of inflammation of the joint, resulting in pain, functional impairment, disability and diminished patient's quality of life (Wang, Iversen, McAlindon, Harvey & Wong et al., 2014). OA is the single most common cause of disability in older adults (Laupattarakasem, Laopaiboon, Laupattarakasem & Sumananont, 2008). The World Health Organization (WHO, 2014) reported that approximately 10% - 15% of all adults over the age of 60 years have some grade of OA, with women having a higher prevalence than men. Worldwide estimates are that 9.6% of men and 18% of women aged over 60 have symptomatic OA, 80% of those diagnosed with OA will have limitations in movement and 25% cannot perform their major daily activities of life (WHO, 2014). It is estimated by 2025 that the prevalence of OA will increase by 40% due to the aging of the world population (WHO, 2014). Although OA occurs all over the world, ethnic differences in its prevalence exists (Dominick & Baker, 2004).

In the Johnson County OA Project, African-American men had a higher prevalence of radiographic hip OA than Caucasian men (32.2% vs. 23.8%), while there was no difference between African-American and Caucasian women (40.3% vs. 39.4%) (Jordan, Helmick & Renner et al., 2009). In the Beijing OA study, hand and hip OA were less prevalent among Chinese than Caucasians, but knee OA was more prevalent among Chinese women than Caucasian women (46.6% vs 34.8%) (Nevitt, Xu & Zhang, 2002; Zhang Xuand & Nevitt et al., 2009).

Epidemiological studies have revealed that there are both endogenous and exogenous risk factors for OA. Endogenous factors include age, sex, hereditary, ethnic origin (more common in persons of European descent) and post-menopausal changes, while exogenous risk factors includes repetitive microtrauma, overweight, resective joint surgery and lifestyle factors, such as alcohol and tobacco use (Lannitti, 2011). OA has multi-factorial etiologies. Blagojevic, Jinks, Jeffery and Jordan (2010) postulated that young adolescent athletes are more prone to the development of early OA due to participation in sport, overweight and obesity, as well as genetic predisposition. In addition, the researchers stated that previous trauma to the knee escalates the risk of knee OA 3.86 times. Although the primary cause of OA is unknown, some of the secondary causes include post-traumatic injuries, congenital/malformation, post-operative malposition (varus/valgus), metabolic disorders and endocrine disorders. Advanced age, female gender, obesity, bone mass, muscle weakness and joint laxity all play roles in the development of joint OA. Symptoms of OA include joint pain, joint stiffness, tenderness, swelling, crepitus and a limited range of motion (Bhatia, Bejarano & Novo, 2013). The management of OA involves a multi-disciplinary approach, as it is a multi-faceted disease with no cure (Roman-Blas et al., 2016). Health professionals usually involved in the management of OA includes physiotherapists, general practitioners, rheumatologists, orthopedic surgeons, nurses, dieticians,

pharmacists and occupational therapists (Finney, Healey, Jordan, Ryan & Dziedzic, 2016). OA intervention includes pharmacological, conservative and surgical management (Bosomworth, 2009). Conservative management of OA is proven as effective as pharmacological intervention (Sakalauskiene & Jauniskiene, 2010). The researchers also stated that most conservative interventions are low in cost, incorporates self-management and it has a substantial public health impact. The four main aims for the management of OA, as stated by Haq, Murphy and Dacre (2002) include: increasing the patient's knowledge of the disease; reducing, coping and managing pain; functional improvements and reduction in the progression of the disease. Conservative intervention such as therapeutic exercises, weight control and change in diet, have shown to be effective in reducing pain and improving function in patients with OA (Sakalauskiene & Jauniskiene, 2010; Bennell, Hunter & Hinman, 2012). In addition, electrotherapy (transcutaneous electrical nerve stimulation), patient education, hydrotherapy, healthy lifestyle intervention and acupuncture (Rannou, Sellam & Berenbaum, 2010) could be included in the conservative management. Aerobic and strengthening exercises seem to be equally effective in terms of reducing pain and increasing function in obese patients with OA, while a combination of diet and exercise can provide optimal benefits in terms of health-related quality of life (QoL) and physical function (VanBaar, Dekker, Oostendorp, Bijl, Voorn & Bijlsma, 2001).

Hospital-based studies have provided evidence that OA is common in Nigeria (Ogunlade, Alonge, Omololu & Adekolujo, 2005; Akinpelu, Alonge, Adekanla & Odole, 2005). These studies reported a preponderance of OA in women; the knee being the most commonly affected joint. Community-based prevalence estimate of OA in Nigeria are not readily available for referencing.

## 1.2 PROBLEM STATEMENT

Research demonstrates short comings in healthcare delivery for OA (Arthritis and Musculoskeletal Alliance, 2004). The symptoms of OA-related pain, disability and depression may be misjudged and not appropriately addressed (Rosemann et al., 2006; Memel, Kirman, Sharp & Hehir, 2000). Assembling evidence of inconsistency in access to joint replacement (Sanders, Donovan & Dieppe, 2004), a decrease in the use of medication (Ganz, Chang, Roth, Guan, Kamberg & Niu et al., 2006) and negated care when waiting for a joint replacement (Parsons, Godfrey & Jester, 2009, Ganz et al., 2006). Some of these deficits may result from the patients' and health professionals' low prospects of treatment (Sanders et al., 2004), the low priority given to a condition seen as part of aging (Gignac, Davis, Hawker, Wright, Mahomed & Fortin et al., 2006) and the reluctance of health professionals to implement conservative management (Rosemann et al., 2006). OA is usually managed with pharmaceutical pain control. If pain control with medication fails, joint replacement surgery may be considered for the patient. There is a great concern regarding the management of patients with OA while waiting for a joint replacement. What is done to decrease and manage their pain and increase their functional ability and QoL? Research suggests significant importance of conservative management of OA (Alricsson, Haarms-Ringdahl, Eriksson & Werner, 2003; Barnes & Edwards, 2005) which has proven to be effective in slowing down the progression of the disease as well as reducing its secondary effects of decreased functional ability. As physiotherapy practice in Nigeria is a second contact service, it is of utmost importance to explore what health professionals think of the conservative management of OA as their opinion may either facilitate or prohibit the necessary referral for conservative management to meet the patients' needs. This study explored health professionals' perceptions and experiences regarding the conservative management of OA at a tertiary hospital in Nigeria.

### **1.3 RESEARCH QUESTIONS**

- 1.3.1 What was the patient profile for patients with osteoarthritis for the period 2012 to 2016 at a tertiary hospital in Nigeria?
- 1.3.2 What are the perceptions and experiences of health professionals regarding the conservative management of osteoarthritis at a tertiary hospital in Nigeria?

### **1.4 AIM OF THE STUDY**

The overall aims of the study were to establish a profile of patients with osteoarthritis and explore the perceptions and experiences of health professionals regarding the conservative management of osteoarthritis at a tertiary hospital in Nigeria.

### **1.5 OBJECTIVES OF THE STUDY**

- 1.5.1 To establish the profile of patients with osteoarthritis for the period 2012 to 2016 at a tertiary hospital in Nigeria.
- 1.5.2 To explore the perceptions of health professionals regarding the conservative management of osteoarthritis at a tertiary hospital in Nigeria.
- 1.5.3 To explore the experiences of health professionals regarding conservative management of osteoarthritis at a tertiary hospital in Nigeria.

### **1.6 SIGNIFICANCE OF THE STUDY**

Osteoarthritis (OA) is a major cause of pain and disability in the elderly, as well as people younger than the age of 45. Research reported the significant importance of conservative management of OA in the early stage, as it has been proven to be effective in slowing down the progression of the disease as well as reducing its secondary effects such as decreased functional ability that is a cause

for disability. Understanding the opinion of health professionals as key stakeholders in the management of OA could enable the researcher to identify facilitators and barriers that may impact on the overall/ conservative management of OA. The opinion of doctors regarding the conservative management of OA is of utmost importance as they refer patients for management to the physiotherapists. Early referral could assist with effective pain management, decrease in disease progression and increase in functional ability and quality of life. Recommendations will be made to the Ministry of Health in Nigeria that could enhance the successful implementation of conservative management of OA in various hospitals in Nigeria.

## 1.7 DEFINITION OF KEY TERMS

**Perception:** an opinion or belief held by people and based on how things seem (Cambridge Advanced Learner's Dictionary, 2014).

**Experience:** the knowledge and skill that you have gained through doing something for a period of time (Oxford Advanced Learner's Dictionary, 2016).

**Health professional:** an individual who provides preventive, curative, promotional or rehabilitative health care services in a systematic way to people, families or community (WHO, 2015).

**Osteoarthritis:** a slowly progressive disease characterised by breakdown of the cartilage, bony changes of the joints, deterioration of tendons and ligaments and various degrees of inflammation of the joint, resulting in pain, functional impairment, disability and diminished patient's quality of life (Wang et al., 2014).

**Health promotion:** any planned combination of educational, political, environmental, regulatory or organisational mechanism that supports actions and conditions of living conducive to the health of individuals, groups and communities (Gold, Robert, Miner & Kathleen, 2002).

**Quality of life:** an individual's perceived view of their position in life, taking into account their circumstances, background, social-economic stance, expectations, morals, the value attached to activities executed daily, the comfort in everyday bodily and psychological function and participation in the home and community (WHO, 2012).

**Prevention:** the reduction of the occurrence of an injury, disease, disability, handicap or any phenomenon that is not needed (Downie, Tannahill & Tannahill, 1986).

**Physiotherapy:** a profession that assists to restore movement and function when someone is affected by injury, illness or disability (Chartered Society of Physiotherapy, 2013).

**Conservative management:** a type of medical treatment defined by the avoidance of invasive measures such as surgery or other invasive procedures usually with the intent to preserve function or body parts (Meriam-Webster, 2016).

**Rehabilitation:** treatment with a goal of helping the affected person to achieve maximum degree of return to their previous level of functioning (Khan et al., 2003).

## 1.8 ABBREVIATIONS

**ACR** American College of Rheumatology

**ADLs** Activities of daily living



<b>BMI</b>	Body Mass Index
<b>DALYS</b>	Disability adjusted life years
<b>EULAR</b>	European League against Rheumatism
<b>FGDs</b>	Focus group discussions
<b>OA</b>	Osteoarthritis
<b>OARSI</b>	Osteoarthritis Research Society International
<b>PHM</b>	Public Health Model
<b>QOL</b>	Quality of life
<b>ROM</b>	Range of movement
<b>UCTH</b>	University of Calabar Teaching Hospital
<b>WHO</b>	World Health Organisation

## 1.9 OUTLINE OF THE CHAPTERS

The main focus areas of each chapter of the research study are summarised and described below

**Chapter One:** This chapter provides information on osteoarthritis, its impact worldwide and the management of the disease. It further describes management options for osteoarthritis, with focus on conservative management, and prevalence of osteoarthritis in Nigeria. The statement of the problem, research question, aims and objectives are stated. Thereafter, the chapter ends with abbreviations, a description of the definitions of terms used and a summary of the chapters of the thesis.

**Chapter Two:** This chapter discusses the prevalence of OA, globally and in Nigeria, clinical signs and symptoms of the disease, how the disease is diagnosed, which areas of the body are affected and the factors that make persons prone to develop this joint disease. The chapter addresses the

various interventions researched for OA, as well as their effects, along with a descriptive look at conservative management of OA. Finally, the chapter ends with the Public Health Approach model relevant to the study.

**Chapter Three:** This chapter describes the methodology used in this study. The quantitative methods description will follow the description of the research setting. The profile of individuals with osteoarthritis, as well as the qualitative methods used to explore the perceptions and experiences of health professionals regarding conservative management of osteoarthritis will be provided. The research design, population, sampling methods, methods of data collection, instrumentation, reliability and validity, trustworthiness and data analysis are described. The chapter ends with the ethics considerations applied in the study.

**Chapter Four:** The results of the statistical analysis that attempted to answer the first two objectives of the study, i.e. to determine the period prevalence of OA and a profile of patients with OA at a tertiary hospital in Nigeria, and to determine the use of conservative management of OA at a tertiary hospital in Nigeria will be presented. The following will be presented in the chapter: an overview of the socio-demographic profile of patients with OA; functional status, and finally, the type of management the patients received. The results are summarized in tables where needed.

**Chapter Five:** This chapter presents the results of the thematic content analysis of the qualitative data which attempted to answer objective three and four of the study, namely to explore the perceptions of health professionals regarding conservative management of OA and to explore the experiences of health professionals regarding conservative management of OA. The description of the participants is followed by the presentation of the findings. Verbatim quotations were used to exemplify the themes and sub-themes.

To ensure anonymity and confidentiality of the participants, cryptogram **P1 to P8 and D1 to D5** were employed to present data. The quotations are italicised and three ellipsis points (...) were used to indicate unnecessary material that was omitted.

**Chapter Six:** Both the quantitative and qualitative results of the study with reference to the relevant literature is discussed in this chapter.

**Chapter Seven:** The summary and the conclusion of the study are provided in this final chapter. In addition, the limitations of the study are stated. Finally, recommendations that emerged based on the findings of this study are outlined.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

This chapter discusses the prevalence of osteoarthritis (OA), globally and in Nigeria, clinical signs and symptoms of the disease, how the disease is diagnosed, which areas of the body are affected, and the factors that make persons prone to develop this joint disease. The chapter addresses the various interventions researched for OA, as well as their effects, along with a descriptive look at the conservative management of OA. Finally, the chapter ends with the Public Health Approach model relevant to the study.

The reviewed literature was gathered by using academic databases and search engines such as Google Scholar, The University of the Western Cape's (UWC) online library, Medscape, EBSCO Host and Nexus Database System. Scholarly papers, online journals, theses and research reports covering the topic, were searched. Keywords such as "osteoarthritis (OA)", "conservative management of OA", "indexes and tools in OA", "physiotherapy management of OA", and all appropriate and recent articles were reviewed. Further references were acquired through scrutiny of the reference lists of relevant articles.

#### **2.2 THE PREVALENCE OF OSTEOARTHRITIS**

Osteoarthritis is a major cause of disability in older adults (Laupattarakasem, Laopaiboon & Sumananont, 2008). Due to risk factors such as obesity and the increase age of the population, the prevalence of OA is increasing (WHO, 2012). OA is the fifth and ninth highest cause of years lost to disability in high and low- and middle-income countries respectively (WHO, 2012). It accounts for half of the musculoskeletal disease burden, and thus is recorded as the highest-

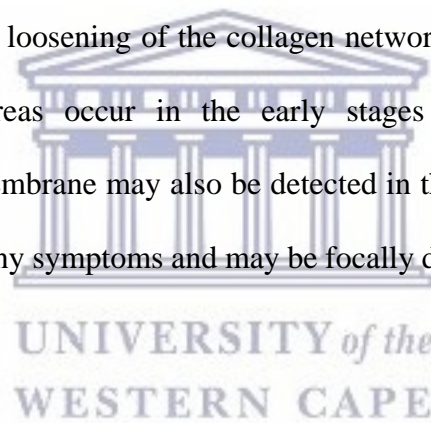
burden condition within the musculoskeletal group of diseases, which also includes rheumatoid arthritis and osteoporosis. X-rays show that knee osteoarthritis is present in approximately 30% of men and women older than 65 years (Teitel & Zieve, 2011). Globally, 9.6% of men and 18.0% of women over the age of 60 years have symptomatic osteoarthritis. The majority (80%) of those with OA have movement limitations while 25% cannot perform activities of daily living (WHO, 2012). Literature indicates that osteoarthritis is the leading cause of disability globally. About 10% of the population over 60, (females more than males), complain of this condition (Rezende, Campos & Paollo, 2013).

OA affects several joint, including the knee, hand, feet, and spine, and is also relatively common in the shoulder and hip joints (Haq, Murphy & Dacre, 2003). Aging and obesity or being overweight in the general population are contributing factors for the high prevalence of OA in the hip and knee joints (Zhang & Jordan, 2010). It is estimated that by 2025 the prevalence of OA will increase by 40% due to the ageing population. Because of the longevity of working careers and the substantial prevalence of OA in middle-aged persons, OA causes a considerable burden in loss of income and early retirement (Hunter, Schofield & Callander, 2014).

Osteoarthritis can be classified as either primary or secondary. Primary osteoarthritis is a chronic degenerative disease associated with aging. As a person ages, the cartilage weakens due to a decrease in the water content, thus making it less resilient and more inclined to degeneration. Genetic inheritance also contributes to at least 60% of all OA cases (Teitel & Zieve, 2011). Secondary arthritis develops earlier in life, often due an injury, an occupation that requires kneeling or squatting for extended periods of time, diabetes, or obesity. Despite the different aetiology than for primary OA, the resulting symptoms and pathology are the same (Teitel & Zieve, 2011).

## 2.3 PATHOLOGY OF OSTEOARTHRITIS

It is proposed that OA is a disease that affects both the cartilage and the entire joint (Felson, 2009). Although OA is ultimately classified as articular cartilage damage and loss, secondary changes include bony remodeling and formation; synovial, capsular, ligamentous and muscular changes (Pollard, Haq, Murphy & Dacre, 2003; Gwilym & Carr, 2008; Bosomworth, 2009). Cartilage distributes forces of the joint across the bone and absorbs shock (Dyer & Heflin, 2005), by the superficial collagen layer resisting shear forces and the deep layer providing strength during loading (Pollard et al., 2008). This function, however, becomes impaired when the external environmental and internal biomechanical forces affecting the joint are not streamlined. OA is characterised by the formation of osteophytes and narrowing of subchondral bone (Abramson & Attur, 2009). Possible reversible loosening of the collagen network and loss of proteoglycans in the superficial cartilaginous areas occur in the early stages of OA (Moskowitz, 2010). Inflammation of the synovial membrane may also be detected in the early stages of OA, but this inflammation may not produce any symptoms and may be focally distributed (Abramson & Attur, 2009).



Swelling occurs initially in OA due to the release of particles in the synovial fluid after damage to the framework (Pollard et al., 2008). Cartilage is subsequently softened, making it more vulnerable to trauma and more force is directed to the bone (Pollard et al., 2008). Decreased joint range of motion follows and the load of the joint is directed toward the damaged cartilage (Pollard et al., 2008). Inflammatory cells occasionally fill the synovial capsule and often develop hyperplasia of the lining cells (Aigner, 2007 as cited in Felson, 2009). Pain is experienced when the synovial capsule, in turn swells. This leads to inhibition of contraction of the muscles crossing the joint, through a spinal reflex (Felson, 2009). The muscles gradually weaken and atrophy, especially when combined with decreased movement. In the initial onset of the disease,

these alterations in the joint can be undone, if the response to the disease is rapid and effective (Pollard et al., 2008).

Irreversible damage occurs in the deeper areas of the cartilage at later stages, causing a reduction in the suppleness of the cartilage (Moskowitz, 2009). As the disease progresses, catabolic reactions outweigh anabolic changes within the damaged joint (Pollard et al., 2008). Hypertrophy and erosion of cartilage mass and focal distribution of cartilage therefore occurs; cartilage water becomes oedematous; dehydration of the collagen within the cartilage occurs; cell activity is increased; synovial tissue becomes inflamed and there is remodeling of the subchondral bone (Pollard et al., 2008). Articular cartilage is aneural, indicating that the link between pain and damage to the cartilage is not well understood and that the source of pain must arise from other structures within the joint (Felson, 2009; Neogi et al., 2009). Nociceptive fibres are found in ligaments, synovial tissue, the surrounding muscle and the outer third of the meniscus, making for alternate sources of pain other than the cartilage (Felson, 2009).

## **2.4 THE IMPACT OF OSTEOARTHRITIS**

OA has an impact on people suffering from the disease, affecting the individual physically, mentally, emotionally and psychologically, causing a ripple effect which impacts the household, workplace, community, society and country at many different levels. OA leads to severe activity limitations, participation restrictions, reduction in quality of life and financial implications for the individual and the greater society (Moskowitz, 2009). The impact of OA is most pronounced in the older population. OA has been found to impact the majority of older citizens in many countries across the world (Badley & Kasman, 2004; McIlvane et al., 2007; Moskowitz, 2009; Paans et al., 2009). OA is the fifth largest cause of activity limitation among people aged 64 to 75 years old (Moskowitz, 2009). Globally, OA has become a rapidly escalating problem in the



Solder generation, leading to severe impact on quality of life. According to the Framingham study, conducted on the effects of specific medical conditions on the functional limitations of elders, OA of the knee, along with cardiac diseases, depression and cerebrovascular accidents (CVAs), is one of the fourth largest causes of disability in adults over 74 years of age (Moskowitz, 2009). OA has been found to be more disabling than any other chronic condition in the older population (Bosomworth, 2009).

Research has shown that the impact OA has on men and women are different. It was found that OA was the seventh leading cause of disability in women and the twelfth leading cause in men, according to the National Hospital Discharge Database (NHANES III) in the USA (Moskowitz, 2009). According to a study on the impact of OA on Canadian women, Badley and Kasman (2004) reported that 21% of the women in their study perceived arthritis to cause pain restricting them from almost all their activities; almost half (45%) of the women in their study felt restricted by some activities due to the severity of pain experienced. OA is one of the primary causes of activity limitation and participation restriction (Messier et al., 2004). Restricted mobility, depression, reduced life enjoyment and limited physical functioning are all caused by the often debilitating pain experienced by persons with OA (Neogi et al., 2009). Hip and knee OA reduces the sufferers' perceived quality of life due to pain experienced and disabling effects on mobility and gait (French, 2006).

Moskowitz (2009) states that OA is a great burden in persons with the disease, and pain and ultimately functional impairment, are significant factors contributing to that burden. Hip and knee OA adversely affect quality of life (QOL) and lead to activity restrictions. Reduced quality of life, activity limitation and risk of chronic diseases of lifestyle are associated with physical inactivity and predicted functional loss, especially in an aged population (Westby & Li, 2007).

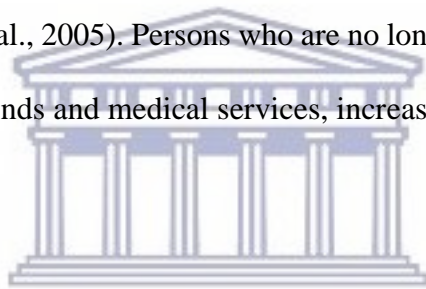


Deterioration in function, quality of life and health status are all a result of OA, therefore positive changes and improvements of these parameters are welcomed in persons battling with the effects imposed by OA (Bosomworth, 2009). The focal obstacle in the impairment of quality of life and the debilitation associated with the disease is the pain caused by OA (McCaffrey & Freeman, 2003).

OA may lead to depression (Sale et al., 2008 as cited in Felson, 2009), psychological disturbances, loss of independence and function, all owing to the pain experienced by the disease (McCaffrey & Freeman, 2003; McIlvane et al., 2007). Persons with chronic pain enjoy less social interaction due to the debilitating nature of the disease, as the pain often robs them of their independence (McCaffrey & Freeman, 2003). OA has cost society billions in medical costs and has caused a decrease in social community involvement (Paans et al., 2009). Income or financial status in society impacts many aspects of people's lives, but more importantly, it has an effect on quality of life and health status. In persons suffering from OA, socio-economic status has an impact on psychological health, resulting from increased pain and impaired function, as persons with a lower income share reported poorer health statuses than those with higher incomes (Allen, Oddone, Coffman, Keefe, Lindquist & Bosworth, 2010). Adaptation of homes and altered mode of transportation, need for one or more assistive devices, home care due to reduced hospital stay and external assistance with household chores, are but a few elements that have all contributed to the gross financial cost of OA's impact on individuals and society (Gupta, Hawker, Laporte, Croxford & Coyte, 2005).

The cost of OA in persons living in rural settings is much higher than for those persons living in an urban area. These are evident in the following forms: paying for additional household assistance when individuals are no longer capable of executing tasks in the home individually, when the home environment is unsuitable due to the crippling effects of OA on the body,

transportation costs to medical facilities, reduced work productivity and use of medical services. These factors have also all been discovered to be a great financial burden to the individual and society (Gupta et al., 2005). Direct costs incurred by OA have been linked to items such as paid household assistance, home adaptations and OA medication. Besides the impact OA has on physical function, health status and quality of life, it has also costs individuals, society and countries substantial amounts in medical costs annually. Socio-economic status is therefore an important, complex and multi-dimensional factor which may determine who might be affected by the disease and how seriously they may be burdened. Therefore, when managing the impacts of OA, the hefty and increasing financial expenses also need to be addressed in order to contest the effects of OA holistically. Poor or loss of productivity in the workplace is often evident in persons affected by the disease (Gupta et al., 2005). Persons who are no longer able to work may therefore be dependent on governmental funds and medical services, increasing the financial burden on the society.



In the workplace, persons with OA may have restricted function and mobility caused by the pain and pathological changes related to the disease, which may often prevent them from going to work for a period of time; this has a gross impact in reducing productivity levels, which could lead the individual to be medically boarded or retrenched, as they are not contributing to the success of an employment institution. The nature of the individuals' work may also contribute to aggravation of symptoms, or even progression of the disease. OA sufferers may need to be reallocated to another work task to accommodate for their limitations in function. In a rural setting, persons with OA have a poorer productivity level than employees in an urban area, as persons need to be absent from work to travel the usually long distances to the nearest health care facility for medical management of their joint disease (Gupta et al., 2005). OA therefore, has a harrowing effect on workers, often causing a vicious cycle of possible unemployment or

early retirement, due to severe functional limitations caused by the disease. This in turn places further strain on a household, community, society and country.

OA therefore affects many factors of an individual's life, often having gross financial and employment implications. OA leads to combination of social, environmental and physical decline, accompanied with escalating economic costs; therefore, all these parameters need to be taken into account when management is planned for a patient.

## **2.5 SIGNS AND SYMPTOMS OF OSTEOARTHRITIS**

### **2.5.1 Joint Pain**

Joint pain is usually the main complaint of symptomatic osteoarthritis which urge patients to seek medical attention. Two kinds of joint pain are identified in OA, namely; mechanical and inflammatory pain respectively.

- **Mechanical OA pain** is often described as a deep and dull ache, localised to one or a few joints. The pain is aggravated by prolonged use or after extreme range of movement of the involved joint(s), by the end of the day, or after an increased mechanical load (Hunter, McDougall & Keefe, 2008). Early in the disease, the pain is only episodic; its precipitants are usually known and predictable and the pain episodes are self-limiting. With the progression of the disease, the pain may become constant and occur at rest, or even at night. During the late stages, this mechanical joint pain may turn into unanticipated episodes of sharp pain superimposed on the pain at baseline (Hawker et al., 2008). This sharp pain is stabbing in character, more severe and stressful, occurring more frequently during movements after a period of resting (Chan & Chan, 2011).

- **Inflammatory pain:** Inflammatory pain is less expectable than mechanical pain.

Change in weather, walking for long distances, slight sprain or displacement of the feet

during walking could be contributing factors. Inflammatory pain can also present simultaneously in the background of mechanical pain. Research reported that the majority of the participants (80%) in a qualitative study on knee OA could differentiate between mechanical and inflammatory pain, describing the character of each very inversely (Chan & Chan, 2011). Inflammatory pain, without any treatment, was described as a burning pain that could continue for days. Resting and ice pack were found to relieve the pain. Unfortunately, how often inflammatory pain occurred was highly erratic, changing from once every few weeks to once every few months. Sometimes the inflammatory pain might have a deteriorating pattern, with the pain decreasing gradually. This pattern could persist for three to four months of a year (Chan & Chan, 2011). .

Irrespective of whether pain was mechanical or inflammatory in nature, patients would elude events that could elicit or aggravate the pain, or take pain medication as a preventive measure (Chan et al., 2011). OA joint pain is usually localized. It can however also be referred pain, for e.g. OA of the hip may refer to the knee; and pain from OA of the cervical facet joints may refer down the upper limb to the hand. It is important to note that the aetiology of joint pain in OA is not well understood and the severity of joint pain does not always correlate with the structural changes of OA seen on X-rays (Hannan et al., 2000). Nevertheless, those with significant radiographic changes are more likely to have joint pain than those with mild changes (Duncan et al., 2007). There is a positive relationship between symptoms and the degree of structural changes in OA (Peat et al., 2006).

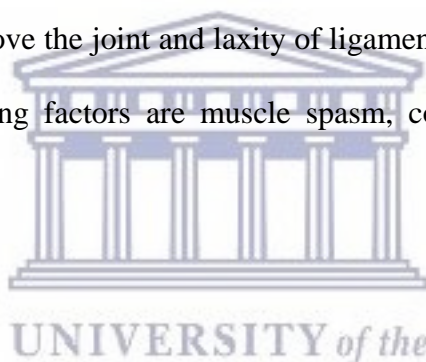
### **2.5.2 Joint Stiffness**

Morning stiffness may be evident in osteoarthritis of the joint. The patients usually experience tightness in the joints, peri-articular soft tissues and surrounding muscles, resulting in restricting movement of the affected joint(s). Joint incongruity and capsular fibrosis due to OA contributes

to the decrease in movement. Stiffness of OA is confined to the region around the affected joint, unlike diffuse stiffness in RA. OA joint usually lasts less than thirty minutes. As the disease progresses, prolonged stiffness could be evident. The stiffness can remain for more than one hour (Evans, 2013; Mobasher, Kalamegam, Musumeci & Batt, 2014).

### **2.5.3 Joint Instability**

Patients with osteoarthritis of joints in lower limb often experience instability or buckling, i.e. shifting without actually falling or giving way (Segal, Nevitt, Welborn, Nguyen, Niu, & Lewis, 2015). It is more common in patients who have OA in multiple joints of the lower limbs as a result of the following: atrophy of the peri-articular muscles; muscle fatigue because the peri-articular muscles has to work harder to move the joint and laxity of ligaments as a result of biomechanical changes in the joint. Contributing factors are muscle spasm, contraction of the capsule and osteophytes.



### **2.5.4 Crepitus**

Crepitus is an audible and palpable cracking or crunching over a joint during its active or passive movement of the affected joint (Firestein, Budd, Gabriel, McInnes & O'Dell, 2015). It is caused by degeneration of the joint surfaces rubbing against each other during motion. Fine crepitus usually indicates roughening of the opposing cartilage surfaces as a result of erosion or the presence of granulation tissues. Coarse crepitus may be formed by inflammatory or non-inflammatory arthritis. Crepitus from within a joint should be differentiated from cracking or popping sound caused by slipping of ligaments or tendons over the bony surfaces during motion. The latter phenomena are usually less contributory to the diagnosis of a joint disease and may be heard over a normal joint (Firestein, Budd, Gabriel, McInnes & O'Dell, 2015).

### **2.5.5 Restricted Joint Movement**

The restricted movement over the degenerated joint can be caused by pain, effusion, capsular contractures, muscle spasm or weakness, intra-articular loose bodies, mechanical constraints by loss of joint cartilage and joint misalignment (Chan et al., 2011). In order to differentiate between the structures that may cause restricted movement, both active and passive ranges of joint motion are tested. The active movements give a rough idea of the range of motion available in the joint, the pain experienced by the patient and the power in the peri-articular muscle groups. Passive joint movement particularly gives information on pain, range and the end-feel. The quality of the end-feel is dependent upon the nature of tissue that is compromising full movement of the joint. For example: elastic end-feel may be attributable to joint effusion. A springy end-feel is appreciated when the joint is springing or bouncing back at the end range by an intra-articular loose body. An abnormal hard end-feel may be attributable to involuntary muscle spasm or capsular contracture. A bony-hard end-feel could be due to bony restraints by loss of joint cartilage, osteophytes impingement and joint misalignment (Chan & Wu, 2012). For better interpretation of abnormal end-feel of a joint, one can compare the sensation with the joint on the contralateral side.

### **2.5.6 Bony Changes and Joint Deformity**

Bony enlargement in OA is attributable to the formation of osteophytes and the remodelling process leading to peri-articular bony hypertrophy and sub-chondral cyst formation. Incongruent degeneration of the joints will also contribute to joint angulations and misalignment (Li Yin, Gao, Cheng, Pavlos, Zhang & Zheng, 2013).

### **2.5.7 Joint Tenderness**

Tenderness with pressure along the joint margin is typical in OA. However, peri-articular

structures may also be tender contributing to the joint pain, for example, myofascial trigger points, adjacent bursitis or tendonitis, and ligament enteropathy (Loeser, 2010). Point tenderness should be sought away from the joint line to find out concomitant painful structures to guide management.

### **2.5.8 Inflammation**

In osteoarthritis, the inflammatory changes that are observed include synovial hypertrophy and hyperplasia with the sub-lining tissue being infiltrated with a mixed population of inflammatory cells (Pelletier et al., 2001). Synovitis contributes towards dysregulation of chondrocyte function in re-modelling the cartilage Extra cellular matrix (Loeser, 2006). Various researchers have implicated T-cells in producing pro-inflammatory cytokines and Matrix metallo-proteinase within the inflamed synovial membranes (McInnes et al., 2000) as well as increased mononuclear cell infiltrates and over expression of mediators of inflammation in early OA (Benito et al., 2005). Variable degree of synovitis may be found in the joints with osteoarthritis, giving rise to local palpable warmth, effusion and synovial thickening. This could also be one of the sources of joint tenderness. These features are usually intermittent and appear with the flare-ups in the osteoarthritic joint.

### **2.5.9 Muscle atrophy**

Peri-articular muscular wasting may be apparent as a result of OA of the corresponding joint due to disuse muscle atrophy. The associated muscle weakness would compromise joint stability and muscle tone around the joint which further jeopardises the integrity of the joint (Chanet al., 2011). For assessment of muscle strength and size, the examiner can perform resisted movement of the joint and by direct measurement of the diameter of the muscle bulk compared to that on contra lateral limb. It is evident that the difference could affect each person diagnosed with OA in



a specific way. If a person knows what to look out for, appropriate management could be implemented timeously to minimise the health consequences of the disease.

## **2.6 RISK FACTORS FOR THE DEVELOPMENT OF OSTEOARTHRITIS**

### **2.6.1 Age**

Age is a substantial risk factor for both radiographic and symptomatic OA at all sites (Neogi, 2013; Sandell & Aigner, 2001). It increases with each decade of life from 33% among those aged 60–70 to 43.7% among those over 80 years of age (Anderson & Loeser, 2010). The relationship between age and the risk of OA is likely multi-factorial and is probably the consequence of numerous individual factors that may include oxidative damage, thinning of cartilage, muscle weakening, and a reduction in proprioception (Cooper, Dennison, Edward & Litwic, 2013). A reduction in cell division and cell generation occurs in the chondrocytes, as they undergo age-related changes (Abramson & Attur, 2009). Ligament laxity, cartilage calcification and reduced awareness of the joint in space classically occurs with advanced age with high probability of OA (Haq et al., 2003). Quadriceps weakness reduces knee joint stability leading to the risk of cartilage damage (Haq et al., 2003). After the age of 70, the onset of bilateral OA is evident in most individuals (Marks, 2007). The higher the age of an individual, the more prone they might be to being affected by the disease, and although OA increases the activity limitations and participation restrictions in all individuals, these effects are emphasised in persons of a more advanced age. Furthermore, the basic cellular mechanisms that maintain tissue homeostasis decline with age, leading to an inadequate response to stress or joint injury and resultant joint tissue destruction and loss.

### **2.6.2 Gender**

Women are not only more likely to have OA than men; they also have more severe OA (Zhang and Jordan, 2010). The incidence of knee, hip, and hand OA is higher in women than in men, and



in women it increases dramatically around the time of menopause. The latter finding has led investigators to hypothesize that hormonal factors may play a role in the development of OA, but the results of clinical and epidemiologic studies have not universally corroborated this (De Klerk, Schiphof, Groeneveld, et al, 2009; Spector, Nandra, Hart & Doyle, 1997; Cirillo, Wallace, Wu & Yood, 2006). A systematic review of seventeen studies found that there was no clear association between sex hormones and hand, knee, or hip OA in women, although meta-analysis of the study result was not possible due to study heterogeneity (Srikanth, Fryer, Zhai, Winzenberg, Hosmer & Jones, 2005).

### **2.6.3 Ethnicity**

Evidence of ethnic differences in knee and hip OA is conflicting. Results from the National Health and Nutrition Examination Survey, suggested higher rates of knee OA in African-American females than in white females. The relative contributions of biological, lifestyle, and socio-economic factors to ethnic differences in OA and disability are unclear. Although ethnic differences in such factors as body mass index might partially explain ethnic variation in radiographic OA, ethnic differences in biomarkers of OA suggests that biological and genetic factors may also play a role (Neogi, 2013).

### **2.6.4 Hormonal Status**

The high incidence of OA in women just after menopause has suggested that oestrogen deficiency plays a role in causing the disease (Roman-Blas, Castañeda, Largo & Herrero-Beaumont, 2009). The majority of cross-sectional studies demonstrate that low bone mineral density is associated with an increased prevalence of hip and knee OA (Hochberg, Lethbridge-Cejku & Tobin, 2004).

### **2.6.5 Nutrition**

Dietary factors are the subject of considerable interest in OA (Felson, Niu, Clancy et al., 2007; Zhang, 2010). One of the most promising nutritional factors for the development of OA is vitamin D deficiency. Without sufficient vitamin D, bones can become thin or brittle.

Protection against knee OA progression has been reported in older men and women with high dietary vitamin D intakes, and for those with high serum levels of vitamin D (Felson, Niu, Clancy, et al., 2007). The Rotterdam Study reported that low vitamin D intake increased the risk of progression of knee OA (Bergink, Uitterlinden, Van Leeuwen, et al., 2009). The Osteoporotic Fractures in Men Study found that men with vitamin D deficiency were twice as likely to have prevalent radiographic OA (Chganti, Parimi, Cawthon, Dam, Nevitt & Lane, 2010), but a more recent longitudinal study of Finnish participants failed to find associations between low vitamin D status and risk of incident hip or knee OA (Konstari, Paananen, Heliovaara, et al., 2012). Although the results are inconsistent, a biologically plausible mechanism for the effect of vitamin D on OA could be postulated, through its important role in bone metabolism, which may modulate peri-articular bone responses to excess loading and joint damage. The results of further studies are awaited. Low vitamin C dietary intake has also been associated with an increased risk of OA progression among participants in the Framingham Study (Zhang, 2010).

### **2.6.6 Bone Density**

Osteoporosis is, like OA, a common age-related skeletal disorder. A systematic review and meta-analysis of the risk factors for the onset of knee OA in older adults has shown that there is a consistent strong association between increased bone mineral density and the onset of knee OA in the three studies that investigated this risk factor in women (Blagojevic, Jinks, Jeffery & Jordan, 2010). Although a definite molecular basis and common pathophysiology have not been identified

to explain the inverse relationship between OA and osteoporosis, a shared genetic component may explain why they seldom co-exist.

### **2.6.7 Genetic Factors**

Genetic factors accounts for atleast 50% of cases of OA (Fernández-Moreno, Rego, CarreiraGarcia & Blanco, 2008).Candidate genes for common forms of OA include the vitamin D receptor gene (which influences bone density and is near the locus for type II collagen, the major form of collagen in hyaline articular cartilage). Strong evidence from family clustering and twin studies indicates that the risk of OA has an inherited component. Classic twin studies have shown that the influence of genetic factors is between 39% and 65% in radiographic OA of the hand and knee in women, about 60% in OA of the hip, and about 70% in OA of the spine (Spector & MacGregor, 2004). Although specific genes have been identified, the individual effects are relatively small: for example, Kerkhof et al., (2010) reported a genome-wide association study showing that the C allele of rs3815148 on chromosome 7q22 was associated with a 1.14-fold increased prevalence of knee and/or hand OA and also with a 30% increased risk of knee OA progression.

### **2.6.8 Obesity and Overweight**

Obesity and overweight have long been recognised as compelling risk factors for OA, especially OA of the knee and hip (King, March & Anandacoomarasamy, 2013). In a study by Kulkarni, Karssiens, Kumar and Pandit (2016) a higher body mass index (BMI) significantly correlated with an increased risk of knee and hip replacement due to OA. In most studies, the increased risk for OA of the knee among overweight persons is higher in women than in men. Obesity is the main preventable risk factor that has been identified in large joint OA (Powell, 2005). Given that obesity

is modifiable by conservative treatment such as weight loss, its potential importance in reducing the incidence of large joint OA cannot be underestimated. Longitudinal data have shown that obesity is a powerful risk factor for the development of knee OA, with one twin study finding a 9–13% increased risk for the onset of the disease with every kilogram increase in body weight (Powell, 2005). In addition, obesity is also a risk factor for the progression of radiological OA (Niu, Zhang, Torner, Nevitt, Lewis & Aliabadi, 2009).

Despite the significant risk imposed by obesity, the mechanism by which the excess weight influences disease onset and progression is unclear. Several studies have examined a metabolic link between obesity and OA with conflicting results, whereas some authors have suggested that metabolic factors are associated with obesity and OA (Jung & Choi, 2014). The National Health and Nutrition Examination which examined serum cholesterol, uric acid, body fat distribution, and blood pressure among 3885 American adults aged 45–74 years old, found no link between these metabolic factors and the association between obesity and knee OA. However, there is emerging evidence that serum leptin is associated with bone area, which may have implications for musculoskeletal diseases, including OA (Carrie, Karvonen-Gutierrez, Sioban, Harlow, Mancuso & Jacobson, 2013). The risk of large joint OA is greater with increased body mass index, but not with any particular patterns of weight distribution. Nonetheless, it is intuitive to suggest that added weight would increase joint reaction forces, which may adversely affect joint cartilage. Interestingly, one study that showed a significant effect of varus angle on progression of knee OA suggested that most of the effect of knee angle on the risk of progression of knee OA could be explained by obesity (Sharma, 2007).

It has also been speculated that obesity increases sub-chondral bony stiffness (Li, Yin, Gao, Cheng, Pavlos & Zhang, 2013), making bone less adept at coping with impact loads. The increased

stiffness of bone may subsequently redistribute a greater force across the underlying articular cartilage, increasing its vulnerability to degenerative changes. Literature suggests that, although both show significant associations, the relationship between obesity and hip OA is weaker than with knee OA (Grotle, Hagen, Natvig, et al, 2008). Recent data suggest that OA is associated with the metabolic syndrome, suggesting a possible common pathogenic mechanism involving metabolic abnormalities and systemic inflammation (Puenpatom & Victor, 2009). Studies have specifically suggested significant associations between OA and cardiovascular risk factors, such as hypertension and hypercholesterolemia. However, clinical evidence of an association between diabetes and OA is inconsistent.

### **2.6.9 Occupational Risk Factors**

One of the most common occupational risk factors for OA is heavy physical work load (Sandmark, Hogstedt, & Vingard, 2000). Other risk factors include frequent exposure to several biomechanical stressors, such as occupations that require workers to use repetitive movements, lift heavy weights, to work at a fast pace, or have what is perceived to be insufficient rest breaks, have been shown to be associated with OA of the hand (Rossignol, Leclerc, Allaert, Rozenberg, Valat, Avouac et al, 2005; Fontana, Neel, Claise, Ughetto, Catilina, 2007). Heavy physical work load or manual labour involving heavy loads, bending of the knee, kneeling or squatting, standing for long hours ( $\geq 2$  hour per day), walking  $\geq 3$  km/day, regular stair climbing, heavy lifting ( $\geq 10$  kg), jumping, and vibration (Sandmark, Hogstedtand & Vingard, 2000; Teichtahl, Wluka, Wang, Urquhart, Hanna, Berry et al, 2010). Results from a British study revealed a more than five-fold greater risk of knee OA among workers  $\geq 55$  years old, who were exposed to a combination of heavy lifting ( $> 25$  kg) and kneeling/squatting or climbing stairs (Cooper, McAlindon, Coggon, Egger& Dieppe (1994) as cited in Yucesoy, Charles, Baker & Burchfie, 2015). Results from the Clearwater Osteoarthritis Study showed that standing on a rigid surface was significantly associated with knee OA among

women, and that stair climbing and jolting of the legs were significantly associated with knee OA among men (Bernard, Wilder, Aluoch & Leaverton, 2010).

## **2.7 PREVENTION OF OSTEOARTHRITIS**

Pharmaceutical treatment exists and surgical options are expensive and not readily available, prevention is the foremost strategy in addressing the disease burden of osteoarthritis.

### **2.7.1 Primary Prevention**

Only a limited number of primary prevention strategies have been identified for OA. It includes the following:

- a) Weight control: Obesity is considered a risk factor for OA. Thus, maintaining or reducing weight through altered diet and increased physical exercise can lower the risk of developing OA (Blagojevic, Jinks, Jeffery & Jordan, 2010).
- b) Occupational injury prevention: Avoidance of repetitive joint use and proper management of related injuries can help prevent OA (Blagojevic et al., 2010).
- c) Sports injury prevention: Taking the necessary precautions to prevent injury such as warming up and using proper equipment can help reduce joint injury (Blagojevic et al., 2010).
- d) Mal-alignment: Improper alignment of the knee or hip can contribute to OA and proper treatment such as orthotics and bracing can help reduce the risk of developing the disease (Neogi & Zhang, 2011).

### **2.7.2 Secondary Prevention**

The aim of secondary prevention is early diagnosis which allows for effective and appropriate

interventions that will minimise the health consequences of the disease. Research into bone and cartilage degradation has identified biochemical markers that may be used to identify OA early in the progression of the disease (Schaller, Henriksen, Hoegh-Andersen, Sondergaard, Summer, Tanko et al., 2005). However, not enough is known about these biochemical markers to implement them in clinical practice. Currently, identification of arthritis is primarily done with x-rays or other imaging methods, but access to well-equipped health care facilities with x-ray technology is limited in many parts of the world (Hunter & Felson, 2006).

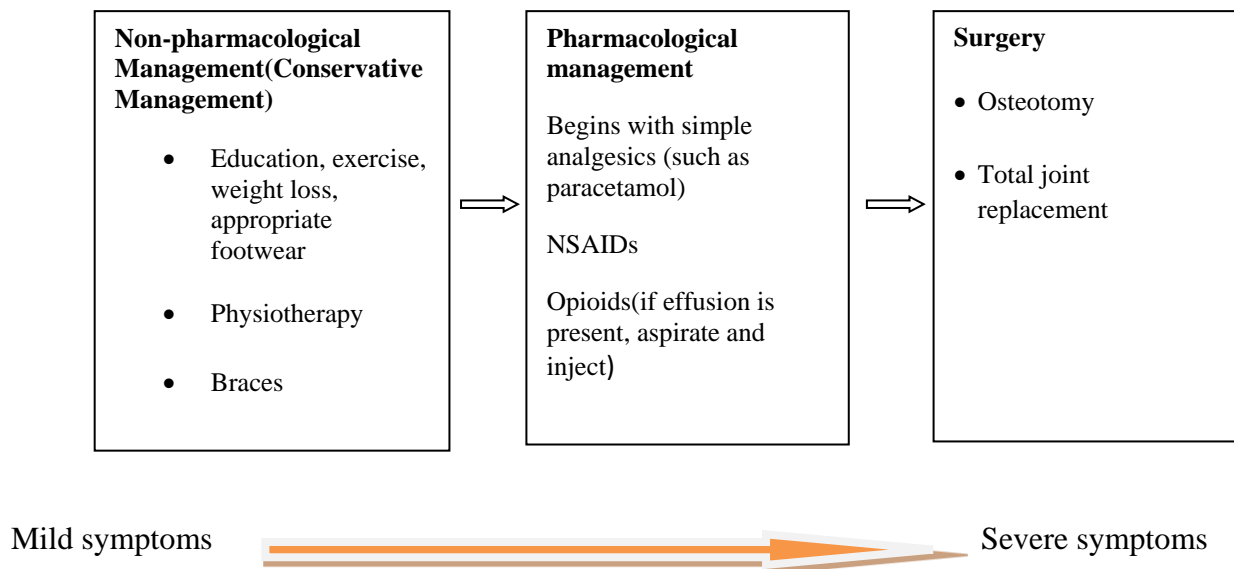
### **2.7.3 Tertiary Prevention**

Tertiary prevention focuses on minimising the complications of the disease once it has been diagnosed. Such strategies for OA are aimed at reducing pain and disability, and improving quality of life. Tertiary prevention strategies for OA includes self-management (weight control physical activity, and education), home programmes, cognitive behavioural interventions, rehabilitation services and medical or surgical treatments (Blagojevic, Jinks, Jeffery & Jordan, 2010).

## **2.8 MANAGEMENT OF OSTEOARTHRITIS**

The management goal of patients with OA, a non-curable disease, is to control pain, minimise disability, and educate the patient and the caregiver about the disease and its therapy. The treatment modalities consist of conservative management, pharmacological management and surgical management (Hunter & Felson, 2006). The recommended hierarchy of treatment should firstly be non-pharmacological (conservative management) treatment, followed by pharmacological treatment and lastly surgery (if the first two are unsuccessful). See Figure 1.1 below.





**Fig 2.1 Therapeutic Options in OA Management (Hunter & Felson, 2006)**

Conservative non-pharmacological OA management covers a broad spectrum of treatment, including hydrotherapy (Fransen, Nairn, Winstanley, Lam & Edmonds, 2007), healthy lifestyle interventions (Barnes et al., 2005) electrotherapy, massage, improving cardiovascular endurance through aerobic exercise (Alricsson, Haarms-Ringdahl, Eriksson & Werner, 2003), prosthetics and orthotic devices (Dyer & Heflin, 2005; Poitras, Avouac, Rossignol, Avouac, Cedraschi & Nordin et al., 2007), change in diet (Messier et al., 2004; Paans et al., 2009), physiotherapy manipulations and mobilisations (French et al., 2009), dynamic exercise, strength training, pain management, walking protocols (Dias et al., 2003), education (Coleman, Briffa, Carroll, Inderjeeth, Cook & McQuade, 2008), cryotherapy and thermotherapy, pacing techniques (Lamb, Toye & Barker, 2008) acupuncture and psychological assistance (Lansdown, Howard, Brealey & MacPherson, 2009).

Four main aims, as identified by Haq et al., (2002) in the management of OA are:

- a) increasing the patient's knowledge of the disease,
- b) reducing, coping and managing pain,



- c) functional improvements, and
- d) reduction in the progression of the disease.

These are mirrored by the treatment and management interventions described in the sub-sections below.

### **2.8.1 Education on OA**

Patient education is one management strategy in conservative, non-pharmacological OA management (Poitras et al., 2007). However, psycho-educational and educational interventions reflect moderate quality of evidence (Jamtvedt et al., 2008). Education should ultimately accompany OA interventions and cover aspects such as the cause of the disease, risk factors, dieting, home advice, exercise, pain and activity management (Haq et al., 2003). According to a research report on the explanation of pain, greater fulfillment and management of a disease, such as OA, as well as less anxiety, is evident in persons who are educated and knowledgeable with regards to their condition (Butler & Moseley, 2003). Education at a biological level on the reasons for the pain experienced allows sufferers insight to mental aspect of their problem/s. The various systems in the body, such as the cardio-respiratory, endocrine, immune and sensory systems are positively affected if an individual conceptualises the aggravating factors of the physiological and anatomical systems, as it changes the menacing impact of the trauma or an executed procedure (Butler & Moseley, 2003). Significant changes have been observed in a randomized control trial when education on the neurological functioning, and not the structure of pain has been done in individual health-worker to patient sessions (Moseley, 2002, as cited in Butler & Moseley, 2003). Further studies found that function and the perception of pain is improved with education (Moseley, Hodges and Nicholas, 2004). Butler and Moseley (2003) also established that education on the neurophysiology of pain enhances patient results in outcome measures and decreases pain thresholds.

These findings were confirmed by the results of a randomised control trial by Hansson, Jonsson-Lundgren, Ronnheden, Sorensen, Bjarnung and Dahlberg (2010), which determined that education in persons with OA in primary care, improved reported well-being and physical activity.

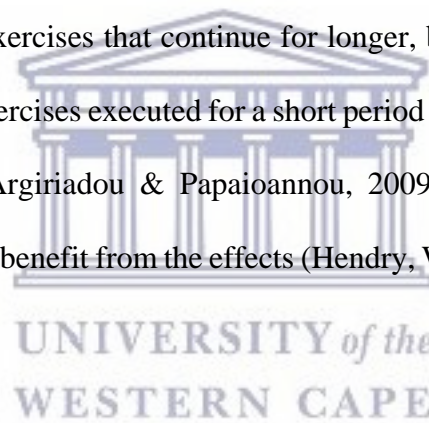
### **2.8.2 Exercise**

Exercise has generated interest as an important non pharmacological treatment for symptomatic OA (Hoozeboom, Stukstette, Bie, Cornelissen, Broeder & van den Ende, 2010). Aerobic and strengthening exercises seem to be equally effective in terms of pain and function and, in obese patients with OA, a combination of diet and exercise can provide optimal benefits in terms of their health-related quality-of-life and physical function (Castrogiovanni & Musumeci, 2016). All of the recent guidelines recommend therapeutic exercise for chronic, subacute, and postsurgical OA. Exercise has a positive effect on musculoskeletal health, reducing pain and improving overall function (Bosomworth, 2009). Czyżewska and co-workers reported that preoperative physiotherapy exercise programmes are well tolerated by patients with end stage hip OA and have a positive influence on selected musculoskeletal system status indicators, quality of life in patients awaiting surgery and improving the early recovery of physical function after total hip arthroplasty (Czyżewska, Glinkowski, Walesiak, Krawczak, Cabaj & Górecki, 2014).

Activity limitation and pain experienced by persons with OA was found to decrease with any variation of exercise therapy (Bosomworth, 2009). Rivalled only by manual therapy, exercise interventions showed high quality of evidence with improved physical function and symptom reduction (Jamtvedt et al., 2008). Bouts of inactivity induced by pain, or general lack of exercise results in muscle atrophy, reduced joint range, muscle shortening and poor endurance (Morse et al., 2005 as cited in Sofianidis et al., 2009). An exercise intervention lowering BMI has a

significant effect on improving function, fitness and endurance; it promotes better health and improves perceived quality of life (Jamtvedt et al., 2008; Paans et al., 2009). Exercise including quadriceps strengthening, improves function and reduces perceived pain in persons with knee OA (Barnes & Edwards, 2005).

Overall, exercise therapy has been infrequently administered as a treatment modality in the management of OA, especially of the lower extremity, even though studies have proved it to have excellent outcomes in persons suffering from the disease (Bosomworth, 2009). In a study by Deyle et al. (2000), it was found that in the long run, persons undergoing exercise interventions are less likely to undergo an arthroplasty than persons receiving placebo treatments, or ultimately no treatment. In addition, aerobic exercises that continue for longer, but are of a lower intensity are more beneficial and safer than exercises executed for a short period of time at high intensities (Shih et al., 2002; Mavrovouniotis, Argiriadou & Papaioannou, 2009). Exercise levels need to be maintained in order to constantly benefit from the effects (Hendry, Williams, Markland, Wilkinson & Maddison, 2006).



The effects of exercise interventions are short lived, possibly due to incorrect individual modifications of treatment regimes, inadequate progressions and dosage of exercise interventions, or even poor compliance to the programmes (Holden, Nicholls, Hay & Foster, 2008). Exercises directed at specific joints and muscles were found to be emphasised in this study (Holden, Nicholls, Hay & Foster, 2008), but both local and global body exercises are effective in pain reduction and functional improvement (Holden et al., 2008). Statistically significant improvements in physical interaction and functional ability, a reduced intensity of experienced pain and an increased level of energy were found in persons participating in a group exercise (Dias et al., 2003). No disease progression or aggravation was found in patients with OA of the knee who had exercised in

comparison to those who had not (Bosomworth, 2009). Exercise and activity are the most effective non-pharmacological treatment approach in managing OA (Shih et al., 2006). Messier et al. (2004) conducted a study with individuals with OA; they were allocated to an exercise and diet programme while the other group was assigned to a healthier lifestyle. The exercise programme ran for an hour, thrice a week for eighteen months. Significantly greater weight was lost in both weight loss intervention groups ( $p < 0.05$ ), relative to the comparison group who were instructed to live a healthier lifestyle (Messier et al., 2004). Perceived pain improved significantly ( $p > 0.05$ ) in the combined diet and exercise group (Messier et al., 2004). Dietary weight loss in combination with exercise has positive effects in persons with OA reporting problems with physical functioning and mobility, compared to persons exercising, dieting or receiving pain therapy in isolation (such as ultrasound and TENS), according to short-term studies (Messier et al., 2004; Haq et al., 2002). Both the experimental and comparison groups (healthy lifestyle) demonstrated better functional parameters, yet a combination of dieting and exercise still had the greatest statistically significant functional improvement (Messier et al., 2004). In both groups of subjects exercising or not exercising, the progression of the disease on X-ray was similar (Messier et al., 2004). Ultimately, exercise needs to accompany a dietary programme, to ensure an improvement in joint mobility and function (Messier et al., 2004).

In a study by Holden et al. (2008) on whether physiotherapists' use of therapeutic exercise for patients with clinical knee OA in the UK was in line with current recommendations, the researchers found that 99% of the sample group of physiotherapists used therapeutic exercise in OA management, in conjunction to other treatment regimes. Exercise regimes included specific muscle strengthening by 90% of the therapists and joint range of motion exercises by 66% of the therapists (Holden et al., 2008). Balance exercises were also occasionally prescribed according to this study,

but it seemed to be dependent on years of experience as a clinician, and post-graduate studies (Holden et al., 2008). In this study, the types of exercises prescribed by physiotherapists were as follows: 10% of therapists prescribed aerobic training, 55% functional tasks, 60% balance exercises, 65% general exercises,  $\pm$  83% ROM exercises and 98% local strengthening exercises (Holden et al., 2008). Adults with OA of the knee are often afraid to exercise in the event of it increasing the intensity of their experienced pain. It is, however, evident that the load on the lower limbs and the speed of gait increased, and the pain in the knees decrease by 30% from baseline (Messier et al., 2004). Exercise does not lead to progression of OA and further articular erosion, as is believed, due to the myth that OA is caused by wear and tear of the joint (Bosomworth, 2009).

#### **a) Long Term Exercise Programmes**

Long term exercise has not been studied extensively, but is thought to have little negative effects on the joint (Bosomworth, 2009). Exercise and other treatment interventions delayed replacement surgery, which is encouraged, especially in younger sufferers, as revision surgery poses larger risks than the initial procedure. Interestingly, it has been found that adults are less likely to be engaged in any physical activity or activity of a moderate to vigorous intensity if they are diagnosed with arthritis, than those who do not have the disease (Shih et al., 2006). Persons with increased levels of pain are less likely to engage in exercise regimes; once the pain has been managed initially, the likelihood of participation escalates, and persons are more likely to experience a long-term pain relief or decrease in pain and comply with the course of the intervention (Shih et al., 2006).

#### **b) Short Term Exercise Programmes**

Research proves that short term exercises combined with a diet programme is more beneficial than weight reduction through dieting alone (Toda as cited in Messier et al., 2004), or exercising

without altering food health. Exercise as a treatment technique in OA has been found to be debatable in many studies, as well as strongly supported by evidence in others. Evidence still does not clearly indicate which exercise intervention is most beneficial in the management of OA and subsequently the improvement of health-related quality of life and community participation (Dias et al., 2003). There is no evidence to support which specific type of exercise is most beneficial in the management of OA of the hip but strengthening exercises may reduce pain even though sufficient evidence is lacking (Moe, Haarvardsholm, Christie, Jamtvedt, Dahm & Hagen, 2007).

### **2.8.3 Weight Reduction**

Weight loss is a difficult challenge, especially as patients with OA are often inactive as a result of the debilitating nature of the disease (Barnes & Edwards, 2005). Over a period of a decade, the odds of developing OA is halved with a weight reduction of as little as 5.1kg (Messier, 2008). Obesity is said to lead to a faster progression of OA (Messier, 2008). Weight reduction as an intervention was found to have high quality of evidence with reduced perceived activity limitation (Jamtvedt et al., 2008). Strength training and aerobic exercise have a similar effect on pain, bone density and functional maintenance in persons with OA (Shih et al., 2006). These interventions are commonly used and have proven to be effective in OA management.

### **2.8.4 Manual Therapy and Joint Mobilisation**

Manual therapy is a conservative, hands-on physiotherapy technique describing either manipulation or mobilisation of the joint structures (Hoeksema, Dekker, Runday, Breedveld & van den Ende, 2004). Manipulations are thrusts locally applied to a joint aspect at a high velocity, aiming to improve the capsule's elasticity, reduce pain and increase soft-tissue mobility. The movement takes the joint beyond its active and passive ROM



(Hoeksema et al., 2004; French et al., 2009). Mobilisations are slower movements more often applied to joints of the appendicular skeleton (Hoeksema et al., 2004; French et al., 2009). These techniques focus on the musculoskeletal system and aim to reduce and relieve pain, improve ROM, positively affect inflammatory responses at the soft tissue, increase stability and elasticity of non-contractile and/or contractile tissues and stimulate improved joint organ nutrition (Hoeksema et al., 2004; French et al., 2009).

A rationale behind manual therapy is the ability of patients to successfully partake in an exercise program once pain and stiffness are decreased marginally with manual physiotherapy techniques (Deyle et al., 2005). Treatment with manual therapy is patient-specific and is preceded by a thorough neuromusculoskeletal assessment (French et al., 2009). Joint mobilisation has confirmed speedy reductions in pain in human studies (Sterling et al., 2001, as cited in Moss, Sluka & Wright, 2007). In patients with mild to moderate OA of the knee, the study by Moss et al. (2007) found that passive accessory joint mobilisation reduced pain significantly, more so than manual contact or non-contact. This highlights the fact that pain is reduced by the continuous movement applied to the joint, rather than the pressure applied on the joint. Instantaneous local and general reduction in pain is therefore evident in persons with knee OA after a single nine-minute joint mobilisation session (Moss et al., 2007).

In a randomized controlled trial on the effectiveness of manual physiotherapy and exercise in OA of the knee, the researchers concluded that patients with knee OA showed functional improvements when manual techniques and an exercise programme was combined as a treatment intervention; the combined treatment techniques may even prevent or postpone the need for invasive procedures such as surgery (Deyle, Henderson, Matekel, Ryder, Garber & Allison, 2000; MacDonald et al., 2006). Clinical and statistically significant results were noted in patients

with knee and hip OA when manual therapy and exercise were combined; pain, stiffness and functional ability all improved, with the effects of the treatment being maintained at one month and one-year post-intervention (Deyle et al., 2000).

Literature revealed manual therapy to be one of the most effective and cost-effective physiotherapeutic interventions, lessening the need for additional costly health measures, such as medication. More research still needs to be conducted into how effective each specific manual therapy technique is in OA management (MacDonald, Whitman, Cleland, Smith & Hoeksema, 2006), but manual therapy has been found to be cost-effective, decreasing the heavy financial burden of OA management; it reduces the need for pharmacological therapy, reduces pain and improves quality of life (MacDonald et al., 2006; Deyle et al., 2005). Physiotherapists often manage OA with the use of manual techniques in combination with an exercise program or other physiotherapy modalities (French et al., 2009). The improvements of manual therapy are maintained long after treatment has ceased (MacDonald et al., 2006).

#### **2.8.5 Bracing and Footwear**

Bracing and corrective footwear may be cost-effective and simple alternatives to more complex or expensive interventions. A variety of assistive devices are widely prescribed to OA patients. Knee braces are believed to reduce pain due to the increased sense of joint position in space, causing a perceived effect of joint stability (Barnes & Edwards, 2005), as well as immobilizing the joint from painful positions (Felson, 2009). In persons with OA of the knee, prepatellar bracing has been found to be most effective (Hinman et al., 2003 and Warden et al., 2008 as cited in Felson, 2009). Orthopaedic shoes have only shown a 6% decrease in abduction movement (varus alignment during gait) at the knee and consequently pain (Hinman et al., 2008 as cited in Felson, 2009).



Osteoarthritis onset as a result of biomechanical imbalances lead to pain, which may be reduced by wedged insoles (Marks & Penton, 2004 as cited in Jamtvedt et al., 2008). Offloading the knee with walking sticks, crutches, walking frames, tripods or quadropods in persons with OA during gait has no positive effect on pain (Deyle et al., 2009). Occupational therapy (OT) is part of the multi-disciplinary approach to OA management through issuing assistive devices, pacing techniques and ensuring independent ADL execution or re-integration to work. Generally, few studies have commented on the effectiveness of this intervention in the management of OA. Treatment in most studies have however been aimed at individuals with milder forms of OA.

## 2.9 CONCEPTUAL FRAMEWORK OF THE STUDY

This study adopted the Public Health Approach Model as a theoretical lens in which the data was collected and analysed (see Figure 2.2 below). The Public Health Approach involves defining and measuring the problem, determining the cause or risk factors for the problem, determining how to prevent or ameliorate the problem, implementing and evaluate effective strategies on a larger scale (CDC, 2014).



**Figure 2.2 The Public Health Approach Model (CDC, 2014)**

This study draws upon the first step of the model, namely to define the problem through the collection of information about the magnitude (prevalence) of the disease as well as the perceptions and experiences of health professionals that can contribute to either being a barrier or

facilitator to the appropriate and effective management of the disease. The descriptive paradigm attempted to provide insight into the “*what*”, “*who*”, “*where*”, “*when*” and “*why or how*”. Within this paradigm the “*what*” refers to the health issue of concern, namely osteoarthritis (OA). The “*who*” is concerned with the person that has the disease, providing valuable information about those “*at risk*”. The “*where*” and “*when*” provide insight into the geographical location under surveillance, as well as the period of observation. Finally, the “*why/how*” attempts to explain factors contributing to either appropriate or not conservative management of the disease, i.e. barriers and facilitators to referral of patients with OA.

## **2.9 SUMMARY OF THE CHAPTER**

This chapter reviewed the relevant literature pertaining to OA, namely: the impact of OA to health, prevalence, causes, signs and symptoms of the disease, risk factors for the development of the disease and management of OA. It also explained and reviewed literature regarding the conservative management of OA in detail. Lastly, as a point of exit, the Public Health Approach Model was reviewed.

Most patients are elderly and are vulnerable to the side effects of non-steroidal anti-inflammatory and analgesic medication. Many patients are at a critical stage of life where their mobility and independence are threatened. Any treatment that decreases pain, improves QoL and function, whilst waiting for definitive surgery warrants serious evaluation. Patients with marked functional limitation and severe pain prior to knee and hip replacement surgery are likely to have a worse outcome at one and two years post-operatively. Therefore, it is important to evaluate other forms of interventions such as conservative management which have proven to be effective in the management of OA, in order to bridge the gap in the effective management of OA.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 INTRODUCTION**

This chapter describes the methodology used in this study. A description of the research setting is followed by a description of the quantitative methods used to describe the profile of individuals with osteoarthritis, as well as the qualitative methods used to explore the perceptions and experiences of health professionals regarding conservative management of osteoarthritis. The research design, population, sampling methods, methods of data collection, instrumentation, reliability and validity, trustworthiness and data analysis are described. The chapter ends with the ethical considerations applied in the study.

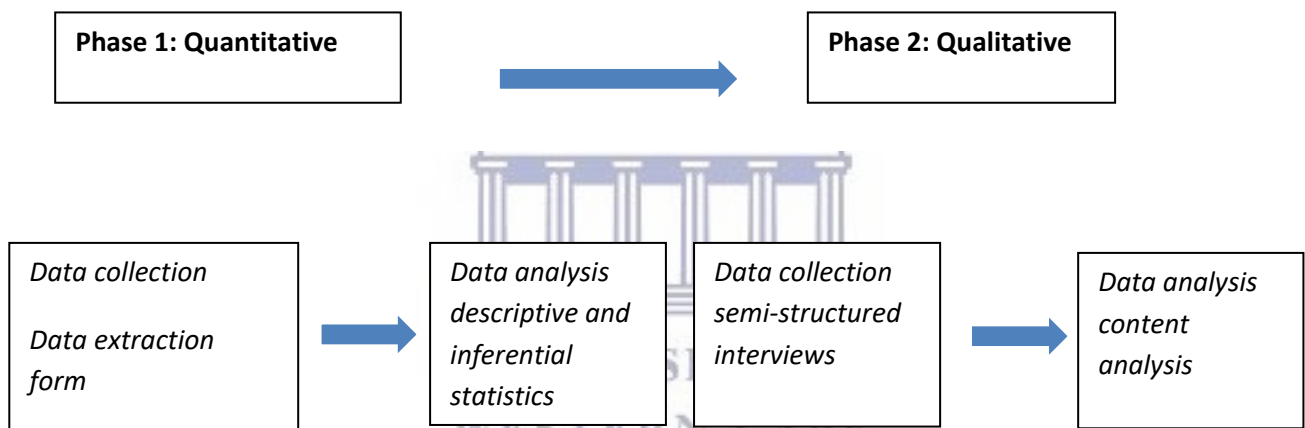
#### **3.2 RESEARCH SETTING**

The study was conducted at the University of Calabar Teaching Hospital (UCTH), situated in the southern part of Nigeria. University of Calabar Teaching Hospital is a tertiary level hospital in Nigeria providing healthcare in all the major branches of medicine. It has a bed capacity of 500. The hospital comprises of different departments and among these are the orthopedics and physiotherapy unit. The hospital has ten orthopedic surgeons and twenty physiotherapists, of which ten work in the orthopedic unit (personal communication with a staff member).

#### **3.3 RESEARCH APPROACH**

A sequential exploratory mixed method approach was employed to achieve the objectives of the study (Figure 3.1 below). According to Creswell and Clark (2007), sequential exploratory mixed methods consist of two different independent phases, namely quantitative and qualitative. The quantitative data was first collected and analysed, followed by qualitative data collection and

analysis. Ozawa and Pongpirul (2014) state that the use of mixed methods provides the researchers with an opportunity to acquire a grander, more meaningful understanding of a given problem as opposed to either approach singularly. This approach has thus become a common feature, especially in the health sciences, including physiotherapy, because of its ability to handle the complexity of health topics. Similarly, Rauscher and Greenfield (2009) show that in physiotherapy, a mixed method approach is valuable due to its high-quality inferences it is able to attain. Based on the research title and the objectives, mixed method is an appropriate approach as it enhances the generation of adequate results to answer the objectives of this study.



**Figure 3.1 Visual Model for the Sequential Exploratory Mixed Method design**

### **3.4 QUANTITATIVE PHASE OF THE STUDY**

#### **3.4.1 Study Design**

A retrospective descriptive design was employed for the **quantitative part** of the study. The design is appropriate for the study because it links the present and past occurrences (Polit & Beck, 2003). Medical records from 1 January 2012 to 31 December 2016 were assessed. A descriptive design makes mathematical data easy to understand (Drummond, 1993).

### 3.4.2 Population and Sample

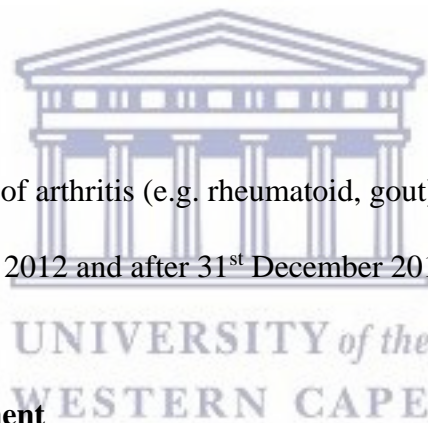
Total population sampling was employed, all medical files of patients who have OA seen at the orthopedic unit at the tertiary hospital in Nigeria between 1 January 2012 and 31 December 2016 was reviewed, and used to determine patient profile of OA and the management of the disease. It is estimated that approximately thirty OA patients are seen in the hospital per year (personal communication with a staff working at the orthopedic unit in the hospital).

#### Inclusion criteria

- Medical records of patients diagnosed by an orthopedic surgeon with OA.
- Records between 1 January 2012 – 31<sup>st</sup> December 2016

#### Exclusion criteria

- Patients with other forms of arthritis (e.g. rheumatoid, gout).
- Records before 1 January 2012 and after 31<sup>st</sup> December 2016



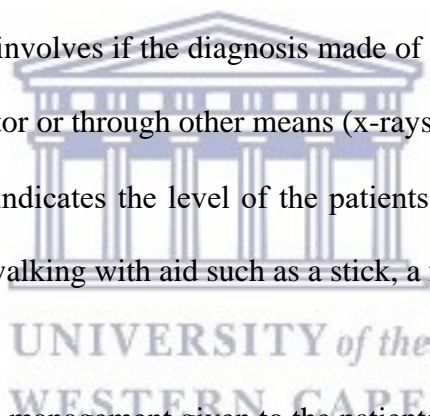
### 3.4.4 Data Collection Instrument

A data gathering instrument (**Appendix F**) was developed according to literature (Labelle & Swaine, 2002; Kaplan, 2005) and the study objectives in order to extract data from the medical records. The extraction form had two sections namely: Section A and Section B.

#### Section A

Includes the socio-demographic information of the patients, namely gender, age, occupation, marital status, mode of diagnosis and functional status. A brief explanation of the specific variables included is given below.

- **Gender:** literature indicates that women are not only more likely to have OA than men; they also have more severe OA (Zhang & Jordan, 2010). Gender was therefore included to assess if the population studied was predominantly women (female).
- **Age:** Literature indicates that age is a substantial risk factor for both radiographic and symptomatic OA at all sites (Neogi, 2013; Sandell & Aigner, 2001). It increases with each decade of life from 33% among those aged 60–70 to 43.7% among those over 80 years of age (Anderson & Loeser, 2010). The age of the patient was recorded from the file or by calculating it from the date of birth given.
- **Occupation:** One of the most common occupational risk factors for OA is heavy physical workload (Sandmark, Hogstedt & Vingard, 2000).
- **Mode of diagnosis:** this involves if the diagnosis made of OA was done by investigation such as x-ray, by the doctor or through other means (x-rays, medical doctor or other).
- **Functional status:** this indicates the level of the patients' functional status if he/she is walking independently, walking with aid such as a stick, a frame, crutches or wheelchair.



**Section B** was used to extract the management given to the patients diagnosed with OA, i.e.:

- Type of treatment (pharmacological/surgical/conservative)
- Time of commencement of treatment
- Type of interventions
- Total number of treatment sessions

### 3.4.5 Reliability and Validity of the Instrument

**Validity:** refers to the idea that an instrument should measure what it is required to measure (Polit & Beck, 2003). A draft of the data extraction form was subjected to peer review by the study supervisor and colleagues who have experience working in an orthopedics unit. This peer review was essential to check for content validity (Domholdt, 2000).

**Reliability:** according to Polit and Beck (2003, p35), is the “accuracy and consistency of information obtained from a study”. A pilot study was conducted. The aim of the pilot study was to identify potential problems with the aim of making corrections before the major study commence (Drummond, 1996). A research assistant was trained to extract data separately from the researcher. Data collected was checked for variations (inter-rater reliability of the data extraction instrument) (Labelle & Swaine, 2002). Any discrepancies on data collected were resolved through discussion.

### **Pilot Study**

The data extraction form was pre-tested on fifteen medical records for patients with osteoarthritis (OA) in the year 2017. These records were not included in the main study since it was from a different year. The aim of the pilot study was to identify potential problems with an aim of making corrections before the major study commences (Drummond, 1996). It also assisted the researcher to ascertain whether the information needed is documented. The terminologies and order of information used in the instrument and that of the file were checked for uniformity. Modifications were made to Section A of the instrument, for example, the date of first visit for treatment at the orthopedic unit and the date of referral for other forms of management was added, as this information gave a better understanding of the time it took for referral to other team members involved in the management of OA.

### **3.4.6 Data Collection Procedure**

Ethics was obtained from University of Calabar Teaching Hospital research committee to access medical folders of patients with OA. A trained research assistant assisted the researcher in data collection. The researcher and the assistant both identified the patients (surname, first name, the file number and address, date of hospital visitation) who had OA, on record book from the



orthopedics unit. The files of patients identified were searched in the central records department. Patients with osteoarthritis were specifically identified from the folders using a list of codes (**Appendix H**). The researcher and the assistant went through the lists to confirm patients with osteoarthritis. The list with the patients who were diagnosed with OA were hand-searched from the central records department. Data was collected from the files using the data collection instrument. The files of patients were manually picked as it was not documented electronically, also the hospital moved to a new site and folders of patient were mixed up.

### **3.4.7 Data Analysis**

Data obtained from the files was analysed using SPSS version 24. Descriptive statistics was employed to summarise the data on socio-demographic information of the patients. Data obtained, such as age, gender, occupation, type of treatment, duration of management and number of treatment sessions was expressed as percentages, mean, standard deviation and presented in frequency tables, charts and graphs. Inferential statistics was employed to determine any association between variables such as age, gender (chi-square tests). Statistical significance was set at  $p < 0.05$ .

## **3.5 QUALITATIVE PHASE OF THE STUDY**

### **3.5.1 Study Design**

An exploratory design was used for the **qualitative part** of the study whereby semi-structured interviews was carried out in order to understand the perceptions and experiences of health professionals regarding the conservative management of OA at a tertiary hospital in Nigeria. Population consists of health professionals (physiotherapists & orthopedic surgeons) working in the orthopedics unit at the tertiary teaching hospital in Nigeria involved in the management of patients with OA (approximately twenty).



All the health professionals (physiotherapists & orthopedic surgeons) were invited to participate in a semi-structured interview.

### **Inclusion Criteria**

- For the **qualitative phase** health professionals (physiotherapists & orthopedic surgeons) involved in the management of patients with osteoarthritis at the orthopedics unit in University of Calabar Teaching Hospital were included.

### **Exclusion criteria**

- Health professionals working in other units in the hospital.

### **3.5.3 Data Collection Instrument**

A semi-structured interview guide (**Appendix G**) was developed based on literature (Kaplan, 2005) and was administered to the health professionals (physiotherapists & orthopedic surgeons) in order to explore their perceptions and experiences regarding conservative management of OA.

### **3.5.4 Data Collection Procedure**

The health professionals (physiotherapists & orthopedic surgeons) were approached and invited to participate in the interview, and a total of thirteen health professionals agreed to participate in the interview. The aim and objectives of the study was explained in an information sheet (**Appendix D**). A convenient time and place was organised for each participant for a one on one interview. A written, informed consent (**Appendix E**) was obtained from each participant before the interview commenced. The researcher assistant explained that their participation was voluntary and they had the right to withdraw from the study at any time. A semi-structured interview guide (**Appendix C**) was used during the individual interviews in English, a language that all the health care

professionals in Nigeria are familiar with. The interview lasted approximately 30 to 45 minutes and a probing technique was used to ensure that no information is missed (Britten, 1995). The research assistant conducted the interview, audio-taped and took field notes for every interview.

### **3.5.5 TRUSTWORTHINESS**

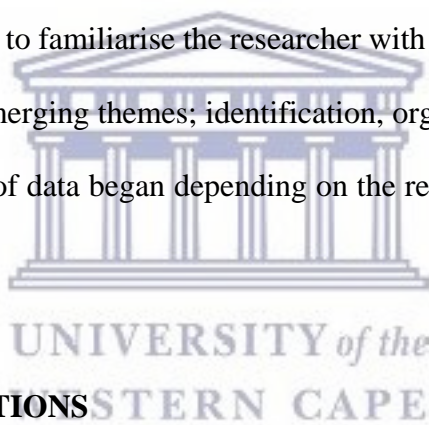
According to Lincoln and Guba (1985), trustworthiness in qualitative data is measured by its credibility which is determined by the match between assembled realism of the participants and the data drawn from the participants presented by the researcher. In this study, the trustworthiness was enhanced through the strategies detailed below:

1. Credibility (internal validity): During the interviews field notes was compared and discussed (member checking) for their accuracy. Each participant was given a summary of the interview after the session. Participants were also given time to comment on whether or not they felt the data was interpreted in a manner congruent with their own experiences. Furthermore, the transcribed verbatim draft was given to a colleague, who was not involved in the study, for his/her view (peer debriefing). Any matter raised by him was incorporated into the written notes.
2. Transferability (external validity): A detailed description of the target population and setting was described. Furthermore, the data analysis documents were made available and gave other researchers the ability to transfer the conclusion of this study to other projects/research.
3. Dependability (reliability): This was achieved by ensuring that the audit trail consisting of the methodology, original transcripts, data analysis documents, field notes and comments from the member checking was transparent, so that any researcher that wants to adapt the process to his/her own settings could do so.

4. Confirmability is measure of how well the findings are supported by the data collected (Lincoln & Guba, 1985). A colleague who was not involved in the study was provided with the verbatim transcripts, analysis and process notes and summaries of the results for his/her opinion.

### 3.5.6 Data Analysis

The qualitative data was analysed by verbatim transcription of the audiotapes. Hammell and Carpenter (2004) stated that verbatim transcription of the data preserves the words of the participants. The transcription was done by an independent person with experience in transcription. The transcription was compared several times to audiotape recordings and field notes to ensure accuracy. Thematic analysis followed whereby the transcription of all the interviews and process notes was read a number of times to familiarise the researcher with the content. The data was then coded into broad categories of emerging themes; identification, organising and naming of themes followed. Finally, interpretation of data began depending on the research objectives and research question.



### 3.6 ETHICS CONSIDERATIONS

Approval was sought from the University of the Western Cape's Biomedical Research Ethics Committee (BMREC) (**Appendix A**). Further permission was sought from the Ministry of Health Nigeria, and the Ethics Committee of the Tertiary Teaching Hospital in Nigeria (**Appendix B**). Thereafter, permission was sought from the director of the hospital. The aim and objectives of the study were explained and made available to all participants in the form of an information sheet (**Appendix D**). Informed, written consent (**Appendix E**) was obtained from each participant before data collection commenced. Participation was voluntary and participants were given the opportunity to withdraw from the study at any time with no consequences.

Anonymity was assured through the use of a code, and not the patient's name, on the data extraction form (**Appendix F**). Information obtained from the medical records and participants was for the study only and was handled with confidentiality. The data collected was stored in a locker only accessible to the researcher and the transcribed verbatim data was stored on a password-protected computer which only the researcher had access to. Pseudonyms were used to protect participants' identities when results were published. Tapes used were destroyed after they had been transcribed and information n documented according to themes. Minimal risks were expected in the study. Any sensitive issues or questions which arose from the study and could affect the participants were observed and carefully handled accordingly or referred to an expert for appropriate attention. The results of the study were made available to the director of the institution.

### **3.7 SUMMARY OF THE CHAPTER**

The University of Calabar Teaching Hospital was the setting for the study. Quantitative and qualitative methods were employed for data collection from the medical records of patients with OA and the health professionals (physiotherapist & orthopedic surgeons) of the hospital respectively. Quantitative data was analysed by means of descriptive and inferential statistics to determine the period prevalence of OA. Individual semi-structured interviews were conducted to gain insight on the perceptions of health professionals regarding conservative management of OA. Thematic analysis was done after qualitative data collection. The results of the quantitative and qualitative analysis are presented in Chapters 4 and 5 respectively.

## **CHAPTER FOUR**

### **QUANTITATIVE RESULTS**

#### **4.1 INTRODUCTION**

This chapter presents results of the statistical analysis that attempted to answer the first objectives of the study, i.e. to establish a profile of patients with OA at a tertiary hospital in Nigeria, including the use of conservative management of OA. The following will be presented in the chapter: the socio-demographic profile of patients with OA; functional status and the type of management the patients received. The results are summarised in tables where needed.

#### **4.2 DEMOGRAPHIC CHARACTERISTICS OF THE STUDY SAMPLE (n=135)**

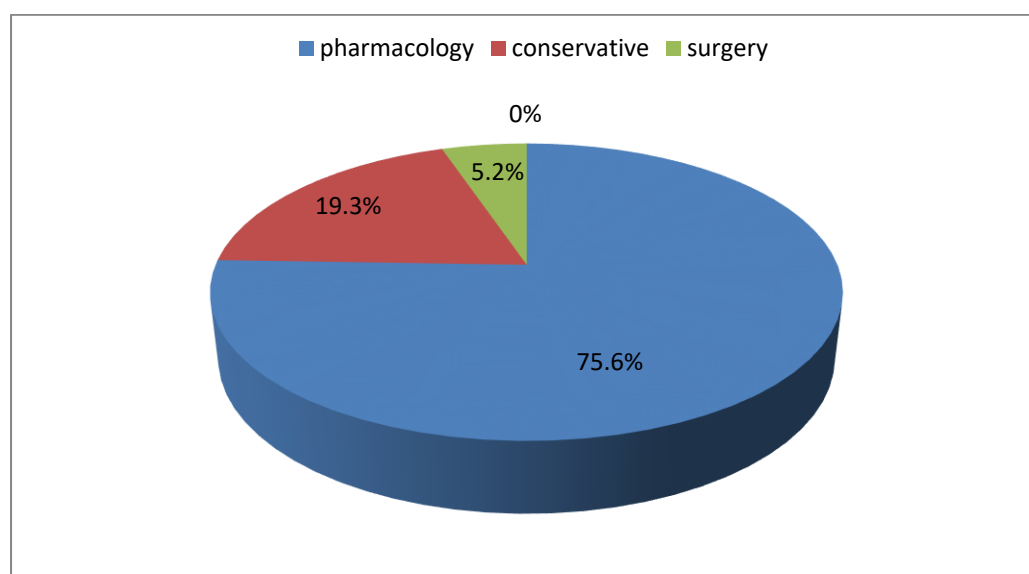
The study sample has more female (n=80; 59.3%) compared to male (n=55; 40.7%) participants (Table 4.1). The mean age of the study sample was 51.85 years old (SD=13.72) for females, and 51.82 years old (SD=17.26) for males respectively. Figure 4.3 shows that the occupation of most of the patients were civil servants (n=62, 47.7%), followed by business men/women (n=52, 40.0%), students (n=13, 10.0%) and housewives (n=2, 2.3%). Of the 135 patient folders, ten did not have data regarding the functional status of the patients. Therefore, the functional status of the 125 completed folders was reported on.

**Table 4.1 Socio-Demographic Characteristics of the Study Sample (n=135)**

Characteristics	Frequency (n)	Percentage (%)
<b>Gender</b>		
Male	55	40.7
Female	80	59.3
<b>Age</b>		
Male (mean=51.82 years old, SD=17.26)		
Female (mean=51.85 years old, SD=13.72)		
<b>Functional Status</b>		
Walking independently	80	59.3
Walking with frame	4	3.0
Walking stick	27	19.9
Crutches	5	3.6
Wheel chair	9	6.7
Missing data	10	7.4
<b>Occupation</b>		
Civil Servants	62	45.9
Business Men/Women	52	38.5
Students	13	9.6
Housewives	2	1.5
Missing data	6	4.4

### 4.3 MANAGEMENT OF OSTEOARTHRITIS OF THE STUDY SAMPLE (n=135)

Management of OA involves three major types of treatment which includes pharmacological, surgical and conservative management. Figure 4.1. Pharmacological management was the type of treatment more often employed (n=102, 75.6%), followed by conservative management (n=26, 19.3%) and surgical management (n=7, 5.2%).



**Figure 4.1** Type of Treatment for Osteoarthritis

A total of 53.9% female (n=55) and 46.1% male (n=47) patients received pharmacology treatment

A total of n=19 (73.1%) female and n=7 (26.9%) male patients received conservative treatment.

A mere seven patients were managed with *surgery*, namely n= (85.7%) females and one (14.3%) male.

**Table 4.2 Treatment Type and Gender of the Study Sample (n=135).**

Variables	Pharmacology n(%)	Surgery n(%)	Conservative n(%)	p-value
<b>GENDER</b>				
<b>Female</b>	55(53.9)	6(85.7)	19(73.1)	0.07
<b>Male</b>	47(46.1)	1(14.3)	7(26.9)	

Association between the types of treatment used in the management of OA of the study sample and gender Table 4.3. No statistical significance was found between gender and type of treatment (p=0.07).

#### **4.4 FUNCTIONAL STATUS OF THE STUDY SAMPLE (n=125)**

Of the 135 patient folders, ten did not have data regarding the functional status of the patients. Therefore, the functional status of the 125 completed folders will be reported on. A total of eighty (64.0%) patients reported to be **walking independently**. More than 80% of the patients walking independently (82.5%, n=66) also received pharmacological management while thirteen patients (16.3%) were treated using conservative management and only one patient was managed using surgery.

Just more than a third (36.0%, n=45) of the patients reported **walking with an aid**. This comprises of those walking with a stick, walking frame, crutches and/or use a wheelchair.



- A total of 27 (60.0%) of the patients walking with an aid reported using a walking stick. Of those using a *walking stick*, 81.5% (n=22) also received pharmacological treatment, while only five patients (18.5%) received conservative management (physiotherapy).
- A total of n=9 (20.0%) patients reported using a *wheelchair*. Of these patients, almost half (n= 4, 44.4%) also received pharmacological management, while two patients (22.2%) had surgery and three (33.3%) were managed using conservative treatment.
- A total of five patients (11.1%) reported using *crutches*. Of these patients, sixty percent (n=3, 60.0%) also received pharmacological management, while each of the remaining two patients received surgery and conservative management respectively.
- Only four patients (8.9%) reported using a *walking frame*. One (0.8%) was managed using pharmacology, while n=1 (0.8%) was managed using surgery and n=2 (1.6%) was managed using conservative treatment.

**Table 4.3 Functional Status and Type of Treatment Received of the Study Sample (n=125).**

Variables	Total	Pharmacology n(%)	Surgery n(%)	Conservative management n(%)	p-value
<b>FUNCTIONAL STATUS</b>					
<b>Walking independently</b>	<b>80 (64.0)</b>	66 (82.5)	1 (1.3)	13 (16.3)	0.002
<b>Walking with an aid</b>	<b>45 (36.0)</b>				
• Walking with frame	4 (8.9)	1 (0.8)	1 (0.8)	2 (1.6)	
• Walking stick	27 (60.0)	22 (81.5)	5 (18.5)	-	
• Crutches	5 (11.1)	3 (60.0)	1 (20.0)	1 (20.0)	
• Wheelchair	9 (20.0)	4 (44.4)	2(22.2)	3 (33.3)	

Functional status was found to be statistically significant with type of treatment ( $p=0.002$ ). Thus, patients who received pharmacological treatment were walking more than those not receiving medication.

#### 4.4.1 Functional Status and Gender (n=125)

A total of 80 patients (64.0%) reported **walking independently**, namely 45 females (56.2%) and 35 males (43.8%) respectively. A total of 45 patients (36.0%) recorded **walking with an aid** (frame, walking stick, crutches and/or a wheel chair).

- Of the 27 patients (60.0%) using a **walking stick**, 15 were females (55.6%) and 12 were males (44.4%).
- Of the nine (9) patients using a **wheelchair**, six (6) were females (66.7%) and three (3) were males (33.3%).
- Of the five (5) patients using **crutches**, four (4) were females (80.0%) and one (1) was male (20.0%).
- Of the four (4) patients using a **walking frame**, three (3) were females (75.0%) and one (1) was a male (25.0%).

**Table 4.4 Functional Status and Gender of the Study Sample (n=125)**

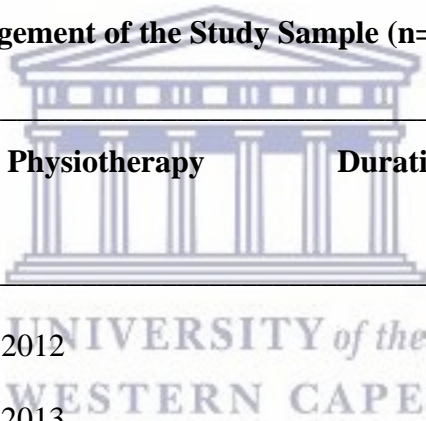
Variables	Walking Independently n(%)	Walking frame n(%)	Walking stick n(%)	Crutches n(%)	Wheelchair n(%)	p-value
<b>GENDER</b>						
<b>Male</b>	35(43.8)	1(25.0)	12 (44.4)	1 (20.0)	3 (33.3)	0.75
<b>Female</b>	45(56.2)	3(75.0)	15 (55.6)	4 (80.0)	6 (66.7)	

No statistical significance was found for gender and functional status of patients with OA ( $p=0.75$ ).

#### **4.5 PHYSIOTHERAPY INTERVENTIONS EMPLOYED IN THE MANAGEMENT OF THE STUDY SAMPLE (n=125)**

A mere 18 patients (14.4%) received physiotherapy management for the period 2012 to 2016. Physiotherapy modalities employed in the management of the study sample included: cryotherapy, therapeutic exercise, soft tissue release, manual therapy, gait re-education, mobilisation and electrotherapy. The duration of treatment ranged from four (4) to twelve (12) weeks. See Table 4.5 below.

**Table 4.5 Physiotherapy Management of the Study Sample (n=18) for Period of 2012-2016**



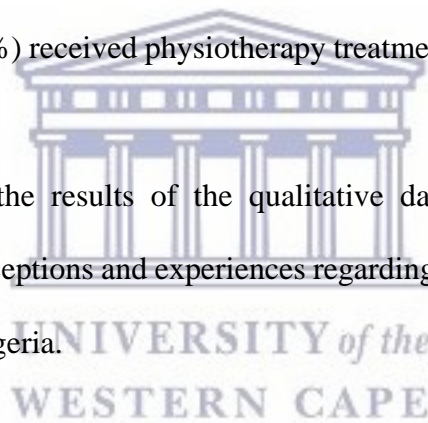
<b>Number of Patients Received</b>	<b>Year Physiotherapy</b>	<b>Duration of Treatment</b>
1	2012	4-6weeks
5	2013	4-10weeks
4	2014	6-12weeks
0	2015	-
8	2016	6-12weeks

#### **4.6 SUMMARY OF THE CHAPTER**

The following fundamental results were obtained from the analysis of the quantitative data of the folders of patients with OA:

- A total of 135 folders of patients presenting with OA for the period 2012 to 2016 were obtained from the University of Calabar Teaching Hospital. With regards to the functional status of the study sample, it was reported that only 125 folders were included in the statistical analysis (See Table 4.1 and 4.4 Functional Status of the Study Sample).
- More females than males were affected with OA for the years 2012 – 2016, namely n=80 (64.0%) and n=55 (36.0%) respectively.
- Pharmacological treatment was more often employed in the management of OA (75.6%), followed by conservative management (physiotherapy) about (19.3%) and surgery (5.2%).
- More than half of the patients walked independently (64.0%), whereas 36% of the patients with OA used a walking aid (walking stick, walking frame, crutches and/or a wheelchair).
- A mere 18 patients (13.3%) received physiotherapy treatment for the period of 2012-2016.

The next chapter will present the results of the qualitative data obtained from health care professionals regarding their perceptions and experiences regarding the conservative management of OA at a tertiary hospital in Nigeria.



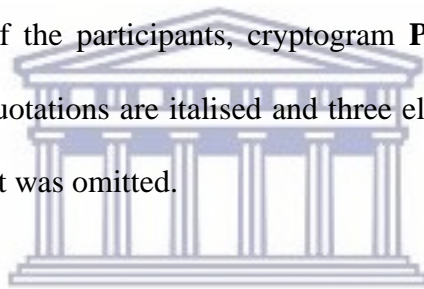
## CHAPTER 5

### QUALITATIVE RESULTS

#### 5.1 INTRODUCTION

This chapter presents the results of the content analysis of the semi-structured interviews which attempted to answer objective three and four of the study, namely to explore the perceptions of health professionals (physiotherapists & orthopedic surgeons) regarding conservative management of OA and to explore the experiences of health professionals regarding conservative management of OA. The description of the participants is followed by the presentation of the findings.

Verbatim quotations were used to exemplify the themes and sub-themes. To ensure anonymity and confidentiality of the participants, cryptogram **P1** to **P8** and **D1** to **D5** were employed to present data. The quotations are italicised and three ellipsis points (...) were used to indicate unnecessary material that was omitted.



#### 5.2 DESCRIPTION OF THE PARTICIPANTS

The researcher invited 20 health professionals through purposive sampling (10 orthopedic surgeons and 10 physiotherapists) working in the Orthopedic unit of the hospital for individual interviews. Five (5) orthopedic surgeons and eight (8) physiotherapists agreed to participate of whom ten (10) were male and three (3) were female (health professionals). The age of the participants ranged between 35 and 63 years old. Table 5.1 below further illustrates some of the information concerning the participants.

**Description of the Interview Participants. Table 5.1**

Participants	Gender	Place of work	Occupation
1	Female	Orthopedic Unit	Orthopedic Surgeon
2	Female	Orthopedic Unit	Physiotherapist
3	Female	Orthopedic Unit	Physiotherapist
3	Male	Orthopedic Unit	Physiotherapist
4	Male	Orthopedic Unit	Physiotherapist
5	Male	Orthopedic Unit	Physiotherapist
6	Male	Orthopedic Unit	Physiotherapist
7	Male	Orthopedic Unit	Physiotherapist
8	Male	Orthopedic Unit	Physiotherapist
9	Male	Orthopedic Unit	Orthopedic Surgeon
10	Male	Orthopedic Unit	Orthopedic Surgeon
11	Male	Orthopedic Unit	Orthopedic Surgeon
12	Male	Orthopedic Unit	Orthopedic Surgeon

### **5.3 PERCEPTION OF PHYSIOTHERAPISTS REGARDING THE MANAGEMENT OF OSTEOARTHRITIS AT THE HEALTH CARE FACILITY**

Responses from the in-depth interviews of physiotherapists on current management of OA at their healthcare facility were similar, indicating the inadequate management of OA. Three themes emerged from the transcribed data, namely inadequate management of OA, limitations and a need for improvement.

### 5.3.1 Inadequate Management of OA

The physiotherapists perceived the management of OA at the University of Calabar Teaching Hospital to be inadequate. The responses below highlight some of their views concerning their perception of OA management at their healthcare facility.

*“I think it is not adequate...” P4*

*“Ermmm...what can I say? I think it’s inadequate.” P2*

On the other hand, some of the physiotherapists reported that they find the management of OA fair.



*“It is fair, but I believe more can be done. It’s not optimal in my opinion...” P1*

*“The management here is not even up to average...I will say it’s fair.” P8*

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Other participants responded as follows:

*“So far so good... nothing is perfect ...everyone is striving towards perfection. That is why we are reaching out for new innovation. So far we are coping... we are trying our best...”*  
**P4**

*“...ermmm... I think the management is good ...ermm...good overall...we work with a team of health care professionals, including the doctors and the physiotherapist, the surgical practitioners too... So yes...” P6*

### 5.3.2 Prompt Referral for Physiotherapy

Physiotherapists perceived limitations to appropriate management. Several limitations to OA management were identified by the physiotherapists and are substantiated by the following quotes:

*“...if the patients are actually diagnosed early enough and referred to physiotherapy early enough a lot of them won’t come down with disability.” P2*

*“Early referral... there should be referral for physiotherapy as fast as possible...” P1*

Another major factor highlighted by the participants is the lack of awareness regarding the management of OA:

*“There is a need for more awareness because most people, especially in this part of the country...in this part of the world most people doesn’t really know that they have OA.” P6*

### 5.3.3 Need for Improvement

The physiotherapists expressed the need for something to be done in order to improve the management of OA. The excerpts below indicate the participant’s views:

*“Yes, I think there is need for improvement ... especially in terms of pain management and how to get the patient more functional.....So I think there is a need for more improvement because that’s one of the things that limit the OA patients a lot.” P5*



*“I think there will be room for improvement in conservative management of OA if more research is done to know the new trends in the management of OA...So I think there is room for improvement.” P3*

Other participants expressed that the management could be improved by early referral for conservative management. They expressed their view as seen below:

*“There should be referral for physiotherapy as fast as possible so that the condition does not progress... as in needing surgery.” P1*

*“...Ermm I think there should be ermm... more referrals to physiotherapists because I observed that a lot of patients are actually placed on analgesics... pain relieving drugs instead of...ermm physiotherapy. Only until the cases are extreme they refer to physiotherapy.” P2*

*“The management could be improved in so many ways for e.g. it could be improved through constant research from the physiotherapy side. The physiotherapist should strive to improve his or her knowledge...” P7*

#### **5.4 PERCEPTIONS OF ORTHOPEDIC SURGEONS REGARDING THE MANAGEMENT OF OSTEOARTHRITIS AT THE HEALTH CARE FACILITY**

Responses from the in-depth interviews of the orthopedic surgeons regarding the current management of OA at the healthcare facility were different to that of the physiotherapists. Three themes emerged from the transcribed data namely; management of OA, barriers to OA management and a need for improvement in the management of OA.

### 5.4.1 Management of OA

The orthopedic surgeons recorded adequate management of patients with OA at University of Calabar Teaching Hospital. The responses below highlight some of their views concerning their perception on OA management at their health care facility:

*"...ermm... I said that our services... or from my own side, is more than adequate ..."* **D1**

*"Erm management has been reasonably satisfactory."* **D3**

One of the orthopedic surgeons agreed with the physiotherapists. See the excerpt below:

*"I think the management of patient with OA is fair in my health care facility."* **D2**

### 5.4.2 Barriers to OA Management

Several barriers to OA management were identified by the orthopedic surgeons. Some of them reported that most patients do not visit the hospital, because they believe there is nothing that can be done, as illustrated below:

*"I have said earlier.... many patients do not believe that bony injury is for hospital."* **D4**

*"I think management should begin with enlightening people on the need to present early to the health care facility."* **D3**

### 5.4.3 Need for Improvement in the Management of OA

The orthopedic surgeons expressed a different view of the improvement of OA, most of which centered around patient education and improvement of theatres. The excerpts below indicate the participants' views:

*“So patient education is very important and I think if we can properly counsel our patient and tell them... let them know the causes of OA for instance...” D1*

*“If we have better investigation equipment and theatres... that would help a lot.” D5*

One participant also expressed the need for a multidisciplinary approach in the management of OA:

*“Eventually... when they present, all the different people in the treatment should be involved. I mean...that is required for proper treatment and to get the best outcome.”D4*



## 5.5 PERCEPTIONS OF HEALTH PROFESSIONALS REGARDING THE CONSERVATIVE MANAGEMENT OF OSTEOARTHRITIS

Both health professionals' perceptions regarding the conservative management of patients with OA highlighted the importance of the stage of the condition. One theme emerged, namely the severity of condition. Participant's responses are reported below:

### 5.5.1 Severity of the condition

Most management of OA done conservatively is dependent on the level or the severity of the condition; mostly mild to moderate OA can be appropriately managed conservatively. Most of the participants agreed conservative management has a role to play in management of OA. The views are expressed below:

*“Yes, it does have a role to play, especially in mild to moderate cases. But in severe cases, I feel that the best is still surgery.” P4*

*“Yes. Actually...conservative management is the best management for me as a physiotherapist, especially in the early stage of the condition.” P6*

*“Conservative management helps with...it’s actually the choice mode of management in some stage of OA. So yes, it has a strong role to play.” P1*

*“Yes, it not only has a role to play... it’s the first line of management in OA care when presented early.” P7*

The orthopedic surgeons’ views are illustrated below. They’ve shared the same sentiments as the physiotherapists:

*“Well what do I think? Emm...yes, it depends on the stage because it not in every stage that you want to jump and do surgery. If it is in the early stages you have to manage conservatively.” D2*

*“Yes it does. Conservative management is part of a management protocol in OA anywhere in the world. It is a very important aspect of the management of the pain.”D4*

The multi-disciplinary aspect was also mentioned by one of the participants:

*“Yeah, it plays a role as a component in the whole management...so...on its own it’s not enough. It usually requires that along with medical and sometimes surgical therapy.”D5*

## **5.6 PERCEPTIONS OF HEALTH PROFESSIONALS REGARDING THE ROLE OF PHYSIOTHERAPISTS IN THE MANAGEMENT OF OSTEOARTHRITIS**

The question: “As part of the management team, what role do physiotherapists play in the management of patients with OA?” had various responses. The physiotherapists reported what they normally do with patients who present with OA when they are referred for physiotherapy management. On the other hand, the orthopedic surgeons have little knowledge of what physiotherapy is all about and what they can offer for OA management. The responses of the participants were categorised into four themes, namely assessment, treatment, health promotion and prevention.

### **5.6.1 Assessments**

Physiotherapists perceived assessment of the patient with OA as very important in assisting them to understand the patient’s condition and planning for appropriate treatment strategies. The sentiments concerning this sub-theme are indicated in the excerpts below:

*“Physiotherapists play a role in assessment of the patients with OA.”P4*

*“If a patient comes to you as a physiotherapist, the first is to assess the patient.”P7*

*“First of all... you have to assess the patient to actually know what brought him or her to your facility... to know the level of damages or the condition of the patient.”P1*

### **5.6.2 Treatment**

The physiotherapists strongly perceived that their main role in patients with OA is to provide treatment. In mild to moderate cases, their main aim is to reduce pain, improve function and maintain the physiological properties of the muscle.

*“Physiotherapists play a role in conservative management of mild to moderate OA... pain management, improving functionality of the patient and maintain muscle properties.” P4*

*“Basically there is a lot of pain. So management is basically pain management and then strengthening. This is usually because of the weakness of the muscle surrounding the affected joint.”P8*

Some of the participants reported the different modalities they employ when treating a patient with OA in the early phase of the condition, namely cryotherapy, mobilisation, exercises therapy and manual therapy.

*“Physiotherapy plays a huge role in the management of OA. In treatment, when OA is acute... that’s when you talk of using cryotherapy to reduce the pain, reduce the inflammation, and mobilisation to improve joint range of motion ...so there are plenty things physiotherapy can do.”P6*

*“In the early stage of OA when there are mild degenerative changes, it will not bein my own opinion the best option to do surgery. So, conservative management remains the best treatment option then.”P5*

*“Physiotherapy is important for OA management...pain relief, improve range of motion and quality of ADL.”P1*

Participants also reported that physiotherapy assists in the rehabilitation of the patient. This is a key acceptance in the management plan, as rehabilitation helps to incorporate the patient back to a good functional status. The responses were as stated below:

*“In rehabilitation, you have to plan your treatment which will be best for your patient. You have to plan it with the patient... trying to get the patient back to how they were before having the condition.”P3*

*“Rehabilitation of the patient usually involves improving the function of the patient. Some of the patients will need to be taught how to climb stairs, because some are living upstairs; also how to get out of bed. This involves standing re-education, walking re-education and adaptation to activities of daily living.” P8*

### **5.6.3 Health Promotion**

Most participants indicate that physiotherapy plays a role in health promotion of patients with OA. The participants stated that they educated the patient based on the management planand also based on the stage of the condition.

This will help the patient to have a better understanding of the condition and hopefully adhere to treatment. Their views concerning health promotion are stated below.

*“Physiotherapist basically helps with health promotion. You see, this helps the patient to have a better understanding of the disease.” P8*

*“Most patients are reluctant to adhere to treatment, but when you educate them of the disease condition it helps.” P7*

*“You have to educate the patient on what to do and what not to do.” P2*

The main aim of health promotion is to educate the patients on the condition to help them have a better understanding of OA. The views of some of the participants illustrate that health promotion comprised of educating the patients and their relatives on the need for weight reduction and diet control. Furthermore, the participants also stated that exercise could enhance patient function.

*“Health promotion... that is where you tell the patient things he or she will do to help maximise the person’s function.” P6*

*“Health promotion is in terms of weight control and diet changes for the patient that has OA.” P4*

*“There is a need for health promotion... you have to educate the patient on what to do and what not to do.” P8*



#### 5.6.4 Prevention

The participants mentioned that physiotherapists can play a role in the prevention of OA through the prevention of risk factors for the development of the condition:

*“Prevention... it can be to prevent the person that already has a knee condition... so we help to strengthen their limbs and ensure they do not develop OA in future.” P1*

*“In prevention you tell the person ...if for example an obese patient...you could advice the patient on weight reduction or refer to a nutritionist.... also lifestyle modification.” P7*

Participants also believed that OA prevention is predominantly dependent on early report of an injury affecting a particular joint. Some of their views are as represented below:

*“If a patient sustains an injury to a joint.....I think is crucial for the doctors to refer the patient early enough for the physiotherapist to examine the joint and treat as appropriate in order to prevent the occurrence of arthritis in future.” P8*

Other participants reported that prevention is also to minimise the development of early deformities of OA:

*“Prevention of early deformities and provision of orthotics and prosthesis... If the doctors refer patients for physiotherapy management, I think it will prevent long effects of OA such as deformities.” P5*

The orthopedic surgeons had very little to say regarding the role of physiotherapy in the management of OA. Their responses were broad, as stated below:

*“Their role is mostly in rehabilitation; physical therapy and exercise of the joints... relieve pain and enhance muscle activity.”D4*

*“Yes they help in rehabilitation of the patient and health promotion of the patient. That’s basically what they do... especially in the rehabilitation of the patient.” D2*

Other responses indicated that the orthopedic surgeons have a vague idea of what contribution physiotherapists can have in the management of patients with OA:

*“Maybe in the area of posture... muscle movement... getting the patient to stand with the correct posture.”D1*

*“They (physiotherapists) play an important role in teaching the patient exercise that would usually strengthen the muscles... relieve pressure on the joint and as well relieve pain.”*

**D3**

## **5.7 EXPERIENCES OF HEALTH PROFESSIONALS REGARDING THE ROLE OF PHYSIOTHERAPY IN THE MANAGEMENT OF OSTEOARTHRITIS**

The participants’ views on the question: “What is your experience with physiotherapy for the management of patients with OA?”two themes were identified, namely effectiveness of physiotherapy and great team members, which was reported below.

### 5.7.1 Effectiveness of Physiotherapy

The participants stated clearly on the effectiveness of physiotherapy, especially when referred early. The participants reported that physiotherapy so far has proven to be effective in the management of OA. See the excerpts below:

*“Physiotherapy has been found to be of great help and benefit to patients with OA.” P3*

*“Erm... yes, physiotherapy is very important in the management of patients with OA... very effective.” P6*

Some of the participants also expressed that physiotherapy can be effective in some cases of OA. See the excerpt:

*“I have seen physiotherapy being adequate for the management of some OA cases while in other cases not at all. I think that’s my experience.” P8*

*“My experience with physiotherapy... I have managed some patient with OA and I think there is much improvement after physiotherapy.” P2*

*“Physiotherapy has been found to be of great help and benefit to patients with OA. They recover better with much lighter impact of pain and level of disability.” P3*

The orthopedic surgeons were very positive regarding the effectiveness of physiotherapy treatment in patients with OA when referred early. Their experiences are stated below:

*“We have had satisfactory results... typically when the patient presents early.”D1*

*“Physiotherapy has been of great help in this facility in the management of OA.” D4*

*“It (physiotherapy) is very important, especially to build the muscle and improve the range of movement.” D3*

*“Well... they (physiotherapists) have always been there and we still refer to them when we have to.” D5*

*“Physiotherapy has proven to be effective in OA management... I can say I have a very good experience with physiotherapy.” D2*

### **5.7.2 Great Team Member**

The participants reported that physiotherapy, as part of the multi-disciplinary team in the management of OA, has proven to be of great benefit. The views are expressed below:

*“My experience is that physiotherapy is an important team member in OA management and if physiotherapists are involved they do a great job.”D1*

*“My experience with physiotherapy has been wonderful in the sense that giving the condition of OA... when properly managed in physiotherapy settings you will get a good result.” D2*

One of the orthopedic surgeons reported he does not actually refer patients for physiotherapy management. He rather prescribes medicines and teaches the patients some exercises.

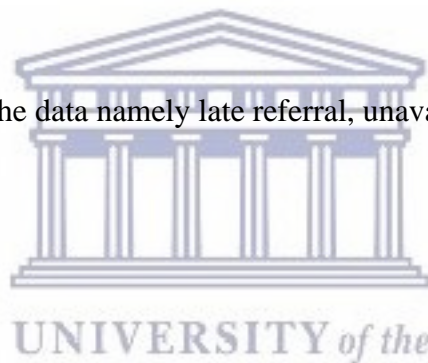
*“I do not necessarily have to refer. I teach them (the patients) certain exercise.”D3*

## **5.8 CHALLENGES ENCOUNTERED BY HEALTH PROFESSIONALS WHEN MANAGING PATIENTS WITH OSTEOARTHRITIS**

The challenges will be presented separately for physiotherapists and orthopedic surgeons.

### ***PHYSIOTHERAPISTS***

Three (3) themes emerged from the data namely late referral, unavailability of resources and non-adherence to treatment.



#### **5.8.1 Late Referral**

Physiotherapists in Nigeria are not first line practitioners. Therefore, they are dependent on the doctors for referrals of patients. Some of their responses are expressed below:

*“For me the challenge I do encounter, is late referral of patient. At this part of the country you will always get patient at the late stage... when it (condition) is a severe case.”P4*

*“Like I said earlier... patients do not also get well because physiotherapists do not get called in on time... or they do not ever get called in at all. We don’t get referral as often as we expect because there is not enough awareness amongst health care physicians.”P1*

*“Prompt referral... the orthopedic surgeon may refer late to physiotherapy and as such complications like stiffness, loss of muscle power, wasting of muscle may have set in. This poses some challenge in trying to rehabilitate the patient.” P6*

*“The major challenge for me is late referral...yes by the time the patient is referred complications has already set in.”P8*

*“Late referral by the orthopedic surgeons... that’s if they want to refer, because sometimes they don’t even refer at all.” P3*

Some participants mentioned that early referral may prevent the risk of development of complications. The excerpts below state:

*“If a patient has OA, early reporting to the clinician is very paramount because with that it will help to stop the progression... and certain complications cannot be efficiently managed later.”P6*

*“If the patients are actually diagnosed early enough and referred to physiotherapy early enough, outcomes may be better.”P1*

### **5.8.2 Unavailability of Resources**

Treatment sessions in Nigeria are usually sponsored by individuals and not the government. Availability of suitable resources enables physiotherapists to carry out treatment effectively. However, lack of resources including infrastructure, treatment facilities and human resources were perceived as challenges by many participants.

Two sub-themes emerged from the results, namely: patient's resources and physiotherapy resources.

#### **a) Patient's Resources**

Physiotherapy treatment for OA usually entails a few sessions. Physiotherapists however, explained that patients have difficulty with finances to attend the treatment sessions. Some of their responses (physiotherapists) are represented below:

*"Sometimes the patients do not have enough money to pay for their physiotherapy sessions."* **P1**

*"Patients can come for treatment today and will not come again and when you call them they will tell you they don't have money to continue treatment."* **P8**

*"Most of my patients miss treatment all the time due to funding."* **P5**

#### **b) Physiotherapy Resource**

The participants expressed the unavailability of necessary resources in management of patients with OA. This is predominantly the lack of necessary facilities or equipment, and innovations to upgrade their current standards, as expressed below.

*"The equipment facility are not optimal... they are not the best for this patients. It is a challenge, but sometimes we try to improvise and treat our patient."* **P4**

*"Facility equipment situation... equipment are not readily available."* **P1**

*“Lack of new equipment ...new innovation...”P5*

Some of the participants reported that the unavailability of orthotics and prosthetics negatively affect the outcome of patients with OA:

*“As a physiotherapist, sometimes I might not be able to get the prosthetics and orthotics... equipment I need for treatment.”P6*

One participant also reported power outage to be a challenge:

*“We have a challenge with power supply...when you want to use a modality for a patient sometimes you don't even have power supply to use the equipment.”P2*

### **5.8.3 Non-Adherence to Treatment**

The participant's responses indicate that the desired outcomes for the patients are sometimes interfered with as a result of the patients' poor adherence to treatment. Under this emerging theme, the responses from the participants gave rise to two sub-themes, including patients' lack of knowledge and non-compliance and motivation.

#### **a) Patients' Lack of Knowledge**

Lack of knowledge regarding the role physiotherapy have to play in the patients' treatment, results in patients not attending treatment sessions or do their home exercise programme, as stated by (P6) and (P1) respectively.



*“Most patients take physiotherapy for granted; in such a way... when they feel they are getting better, they tend to stay away for a long time.”P6*

*“Patients don’t do the programme (home exercises) they are given, because they feel it’s too tedious or too easy.”P1*

#### **b) Non-Compliance and Lack of Motivation**

Non-compliance and lack of motivation due to their emotional status definitely impedes the patients’ adherence to treatment. These sentiments are expressed by the participants below:

*“Sometimes the patients are depressed or they have some kind of psychological condition that could affect the outcome of treatment.” P2*

*“Pain is usually what brings them to hospital and once it’s not going away... as they expected... they become very depressed and hence don’t comply with treatment.” P5*

*“Adherence to their exercise routine... some patients, they do not adhere strictly to the exercises prescribed to them by the physiotherapist. So at the end of the day they do not do well in as far as recovery is concern.”P6*

#### **ORTHOPEDIC SURGEONS**

Two major themes emerged from the data namely: non-compliance to medicine and cost of surgery.

### **a) Non-Compliance to Medicine**

Non-compliance of the patient to the prescribed drugs (medicine) regime is mainly due to the side effect of long term use of pain medication on the gastric mucosa. See excerpts below:

*“The major challenge is patients’ non-compliance to the drugs given to them.” D1*

*“If they have to be on medication for quite a while compliance becomes the problem... taking this medication for a long period, like the NSAID, has a negative effect on the gastric lining.” D3*

*“Some patients are not compliant with the drugs. The side effects of the drugs may be a challenge... both NSAIDs and opioids.” D4*

*“Some patients find it difficult to adhere to prescriptions. The side effects of the analgesics are very bad and a lot of them abuse the drugs just because they want to make the pain go away... they take more than prescribed... these patients develop complications like ulcers.” D5*

### **b) Cost of Surgery**

Surgery is the last option in the management of OA, but as expressed by the orthopedic surgeons, it should be a priority treatment option for many of their patients with OA. The participants emphasised that the cost of surgery is a major challenge for the patients. Their response is as reported below.

*“Funding is the biggest challenge ...most patient can’t afford the cost of surgery ...therefore this hinders appropriate management.”D3*

*“Where we have issues is on those with severe OA requiring joint replacement surgery and this joint replacement surgery are quite expensive and not readily available.”D2*

## **5.9 SUMMARY OF THE CHAPTER**

Results of the qualitative data helped us to understand the perceptions and experiences of health professionals regarding conservative management of patients with OA. In addition, some of the challenges health professionals’(physiotherapist & orthopedic surgeon) experiences in the management of patients with OA at their healthcare facility are outlined. The results indicate that both physiotherapists and orthopedic surgeons perceive conservative management (especially physiotherapy) of patients with OA as important. However, most physiotherapists felt that the management of patients with OA is inadequate, and still needs a lot of improvement, while the orthopedic surgeons stated cost of surgery and non-compliance with medicine regimes as challenges they face in the management of OA. The orthopedic surgeons could not clearly state the role of physiotherapists in the management of patients with OA. It is thus evident that there is much room for improvement in the management of patients with OA, for instance earlier referral of the patients for physiotherapy management, increasing awareness of physiotherapy management amongst orthopedic doctors and improvement in resources..

The next chapter will present the discussion of both the quantitative (Chapter 4) and qualitative (Chapter 5) results of the study.

## **CHAPTER SIX**

### **DISCUSSION**

#### **6.1 INTRODUCTION**

This chapter will discuss the findings of both the quantitative and qualitative results of the study with reference to the relevant literature. The overall aims of the present study were to establish a profile of patients with OA and to explore the perceptions and experiences of health professionals (physiotherapist & orthopedic surgeon) regarding the conservative management of OA at a tertiary hospital in Nigeria.

#### **6.2 TYPE OF TREATMENT RECEIVED BY PATIENTS WITH OSTEOARTHRITIS**

According to the Osteoarthritis Research Society International (OARSI) and the American Academy of Orthopedic Surgeons (AAOS), the mainstay of OA treatment involves physical modalities (conservative management-physiotherapy), drug therapy (pharmacology), and surgery (Zhang, Moskowitz, Nukiet al., 2008). This suggests that the hierarchy of OA management is conservative (physiotherapy)→pharmacological→surgery. Surgery is only considered for severe cases when conservative therapy proven ineffective because of the invasive trauma and higher risks (De Luigi, 2012; Ernst & Posadzki, 2011).

In the present study pharmacological management is the most commonly used OA treatment option, as more than three quarters n=102 (75.6%) of the participants were managed using medication. It is important to note that although pharmacological management is the main treatment option, the possible side effects of the medication should not be overlooked. This also explains the possible non-adherence to treatment, as stated by the orthopedic surgeons in the present study. It is estimated that the occurrence of adverse effects is 30% in people taking

NSAIDs (Pirmohamed, James et al., 2004). According to Sostres, Gargallo & Lanas, (2013) about 1 to 2% of NSAID users experienced a serious gastro-intestinal complication per year during treatment.

#### **6.4 PERCEPTIONS OF HEALTH PROFESSIONALS REGARDING OSTEOARTHRITIS MANAGEMENT AT THEIR HEALTH CARE FACILITY**

Physiotherapists in the present study reported that the management is inadequate and there is room for improvement, whereas the orthopedic surgeons said the management is more than adequate and satisfactory. The views of the orthopedic surgeons in the present study is in stark contrast to a 2014 Australian study which reported the general practitioners' dissatisfaction with the care they can provide patients with OA (Arthritis Australia, 2014). It is however of great concern that the orthopedic surgeons find the management to be satisfactory or adequate as Hunter and Felson (2006) stated, that conservative management should be the first treatment option for patients with OA. The recommended hierarchy of treatment should be non-pharmacological (conservative management) treatment first followed by pharmacological treatment and then surgery, if the first two are unsuccessful (Hunter & Felson, 2006). The results are also consistent with similar surveys of patient preferences whereby medications and physiotherapy were the most requested interventions by patients with OA of knee when consulting their GP (Mitchell & Hurley 2008).

The physiotherapists in the present study also stated that the lack of prompt referrals contribute to patients with OA not being managed effectively. Early referral could assist with the delay in progression of the condition as OA develops progressively over many years. Thus, identifying OA in its earliest stages could reduce the impact of the condition on the QoL of the patients. Early identification allows the timely initiation of appropriate interventions to prevent or slow the progression of the condition before irreversible joint damage occurs (Arthritis Australia, 2014).

The present study therefore highlights the need for research on the effective management of OA and the referral practice of medical practitioners in other tertiary hospitals across Nigeria.

Participants also reported that people regard OA as an inevitable part of aging, and that patients tend to present late because of the gradual onset of pain and disability. The need for improvement in terms of pain management, and to improve the functional abilities of patients as mentioned by the physiotherapists in the present study were also reported by Thomas et al. (2009), who demonstrated that physiotherapy interventions are effective in reducing pain and increasing function in patients with OA. Rosemann, Wensing, Joest and Backenstrass et al., (2006) also reported the need for improvement in pain management and functional status of the patients. Patient education and updated theatre environment were aspects mentioned by the orthopedic surgeons in the present study that need improvement. It is however, evident that their (orthopedic surgeons) perceptions regarding patient education only include aspects of drug regime adherence and not referral to physiotherapy for proper education on OA-related aspects. Therefore, lack of awareness of the role of physiotherapy in OA management.

## **6.5 PERCEPTIONS OF HEALTH PROFESSIONALS REGARDING THE CONSERVATIVE MANAGEMENT OF OSTEOARTHRITIS**

The participants in the present study responses regarding the conservative management of patients with OA were based on the severity of the condition. Both physiotherapists and orthopedic surgeons stated that mild to moderate cases of OA can be managed conservatively, however, very severe cases require surgery. This tendency does not reflect in the quantitative findings of the study, which indicates a high prevalence of pharmacological treatment, as opposed to conservative management. Research showed that conservative treatment modalities in both knee and hip OA are underused (Shrier et al, 2006; McHugh, Luker, Campbell, Kay & Silman, 2007; Snijders et al, 2011).

Sub-optimal use of conservative treatment modalities might be associated with health care provider-related factors, such as lack of knowledge about conservative treatment options, or with patient-related factors, such as patient preferences (Hofstede, Vlieland, Van den Ende, Marangvan de Mheen, Nelissen & Van Bodegom-Vos, 2014). The result of the present study thus highlights the need for awareness for the effective utilisation of conservative management as it relates to OA. Physiotherapists know all the modalities of conservative management, but because of them being second-line practitioners in Nigeria, they are dependent on doctors for referral. Thus it is of utmost important that doctors should be re-educated about role of physiotherapists in the multi-disciplinary team in management of OA.

## **6.6 PERCEPTIONS OF HEALTH PROFESSIONALS REGARDING THE ROLE OF PHYSIOTHERAPISTS IN THE MANAGEMENT OF OSTEOARTHRITIS**

The participants in the present study's perceptions on the role that physiotherapists play in the management of patients with OA identified four major themes, namely assessment, treatment, health promotion and prevention.

### **6.6.1 Assessment**

The physiotherapist stated that their role in the management of patients with OA started with an assessment of the patient. This is in agreement with a study which highlighted that physiotherapists assess patients with the aim of getting a comprehensive overview of the patient's health status primarily in terms of activity limitations and participation restrictions (Peter et al., 2011). Physiotherapists have historically used outcome measures (for example, range of motion, strength, and pain) within the "body structure and function" domains of the World Health Organisation's International Classification of Functioning, Disability and Health (ICF) (Haigh et al, 2001; WHO, 2001; Decker 2002; Lohmann, Decker, Müller, Strobl & Grill, 2011).



Therefore, outcome measures that capture “activity and participation” (involvement in a life situation such as work and leisure) are essential to evaluate the full spectrum of functioning (Rastogi, Davis & Chesworth, 2007; Westby & Backman, 2010). In the present study physiotherapists perceived assessment of the patient with OA as very important in assisting them to understand the patient’s condition, current functional status and planning for appropriate treatment strategies.

### **6.6.2 Treatment**

Physiotherapists perceived that their main role in management of patients with OA is to provide treatment. The intervention given is based on the severity of the condition. In mild or early cases of OA the physiotherapists affirmed that the treatment is to prevent complications and deformities which might lead to severe OA. The aim of physiotherapy was to reduce pain, improve function and maintain the physiological properties of the muscles. This finding was in agreement with Bhatia, Bejarano and Novo (2013) where the physiotherapists aimed to decrease pain, increase the range of motion, increase the overall functional strength, educate patients about posture and gait, as well as to improve physical fitness levels and mobility. Ayanniyi, Egwu and Adeniyi (2016) listed some of the techniques employed by physiotherapists used in the management of patients with OA, namely thermotherapy (heat/cold), therapeutic exercises, manual therapy, electrotherapy and acupuncture. The researchers reported that thermotherapy was the modality most frequently employed (86.1%) followed by therapeutic exercises (81.3%) in combination with other modalities. In addition, manual therapy was also used (58.4%), electrotherapy (27%) and acupuncture (3.4%) (Ayanniyi et al., 2016). In the present study, physiotherapists reported to use modalities such as m cryotherapy, mobilisation, exercises therapy, manual therapy, electrotherapy and home programmes.



The physiotherapists in the present study used different combinations of treatment modalities. It might be due to the fact that there is no documented treatment protocol for the management of OA. Research also stated there is a disparity in practice between physiotherapists in Nigeria and those of Western countries such as the UK, Canada, and USA on the appropriate utilisation of recommended core modalities in the management of knee OA (Ayanniyi et al., 2016); this could be because these countries are developed countries, as opposed to the former being a developing country. These interventions were also seen in the findings of the quantitative study “modality employed”; this revealed that 13.3% of the 19.26% of patients with OA treated using conservative management were managed using physiotherapy. This suggests that physiotherapy management is not optimally utilised at the health care facility in the present study.

Physiotherapy has been proven to be effective in OA management and it aims at pain management, functional improvement and prevention of deformities (Mushtaq, 2011). Participants (physiotherapists) also reported physiotherapy aids in rehabilitation of the patient. This is a key aspect in the management plan, this is because rehabilitation helps patients achieve their goals and reach maximum functional potential. Physical therapists (PTs) as rehabilitation experts, have a unique role to play in fostering independence for people with disability and reducing human disability levels in Nigeria (Amusat, 2009). Physiotherapy has long been a component of patient rehabilitation and its effectiveness especially in patients with OA is well documented (Fransen, Crosbie & Edmonds, 2001).

### **6.6.3 Health Promotion**

In terms of health promotion, the physiotherapists stated that health promotion is within their scope of practice. This is in line with the public health approach model which states that OA is a public health problem (CDC, 2014). This finding is in concordance with international reports about the

condition, which revealed that OA is an under-recognised public health problem in many parts of the world (Rosemann, Laux & Kuehlein, 2007; Lim & Doherty, 2011). The physiotherapists stated that they educated the patients on the management plan and the disease condition, to help the patients have a better understanding of the condition and adherence to treatment. According to the World Confederation of Physical Therapists (WCPT) (1999), Physical therapy as a profession is concerned with identifying and maximising the quality of life and movement potential within the spheres of promotion, prevention, treatment or intervention and rehabilitation. Physiotherapists are in an ideal position to promote health and wellness in their patients and clients (American Association of Physiotherapy, 2013). However, patients/ clients often fail to recognise the role of the physical therapist in promoting health (Kearns, Ponichtera, Rucker & Ford, 2014). To encourage patients/clients to view physical therapists as promoters of health, we should take a more active role in educating patients/clients about our role (Kearns, Ponichtera, & Ford, 2014). A study in Nigeria by Aweto et al. (2013) revealed that 63.6% (n=196) of the physiotherapists have good knowledge and 94.8% (n=292) have attitude towards physical activity promotion in patient management. Only 111 (36%) of the respondents counseled more than ten patients in the past one month on the benefits of adopting a more physically active lifestyle (Aweto et al., 2013).

#### **6.6.4 Prevention**

The physiotherapists did not have a response on prevention of OA. Most of the participants reported on the prevention of the disability caused by OA. In this study the participants reported that proper management of injury repetition, lifestyle modification in terms of obesity, proper rehabilitation on joint injuries with early detection can all help in prevention of osteoarthritis and disability. According to Aweto et al. (2013) Nigerian physiotherapists have good knowledge and attitude towards promotion of physically active lifestyle in their patients, but do not counsel many of them, due to insufficient consultation time.

The orthopedic surgeons have little knowledge on what role physiotherapists play in the management of OA. Therefore, they reported what they felt as the role of physiotherapy (massage and rehabilitation). They (orthopedic surgeons) did not report on physiotherapy assessment, treatment and prevention. This could be that they do not know physiotherapists are involved in the assessment and treatment plan of patients or they have no better understanding of what physiotherapists do. The participants (orthopedic surgeons) reported that the role of physiotherapists is mainly in rehabilitation, teaching patients exercises and postural correction. This reflected in the findings of the quantitative study which revealed a higher prevalence of patients treated with pharmacology treatment as opposed to other forms of management, 19.3% of patients with OA were managed using conservative management (physiotherapy)”, whereas 75.6% of patients with OA were managed using pharmacological treatment. This is evident on the poor referral pattern of doctors to physiotherapy for conservative management.

A study conducted in South Africa reported that medical practitioners tend to be unsure about the specific role physiotherapists play in the management of individuals living with musculoskeletal disease (JansenVanRensburg, 2017). One type of conservative non-pharmacological treatment is physiotherapy interventions which have been proven to be effective in the management of OA (Thomas et al., 2009; Jansen et al., 2011).

## **6.7 EXPERIENCES OF HEALTH PROFESSIONALS REGARDING THE ROLE OF PHYSIOTHERAPY IN THE MANAGEMENT OF OSTEOARTHRITIS**

Both the physiotherapists and orthopedic surgeons agreed on the effectiveness of physiotherapy and also a great team member in the management of OA. Evidence exists on the beneficial effect of physiotherapy on OA (Deyle, Henderson, Matekel, Ryder, Garber & Allison, 2000; Fransen, Crosbie & Edmonds, 2001). The orthopedic surgeons were very

positive regarding the effectiveness of physiotherapy treatment in patients with OA. Orthopedic surgeons also stated that as much as physiotherapy is effective in OA management, physiotherapists are not readily involved or readily available for team management. This suggests that physiotherapists should be more involved with awareness amongst health professional, health promotion, and OA management.

On the question if orthopedic doctors refer to physiotherapy for conservative management (Physiotherapy), one of the orthopedic surgeons reported he does not actually refer patients for physiotherapy management. He rather prescribes medicine and teaches the patients some exercises, whereas some of them (orthopedic surgeons) stated that they do refer. Reid, Potts, Burnett & Konings (2014), reported that 18% of patients with OA were referred by the orthopedic surgeons, 53% by the general practitioner whereas 29% were on self-referral. This suggests that orthopedic surgeons do not often refer patients to physiotherapy probably because they lack knowledge on what physiotherapy does for patients with OA. Therefore, physiotherapists are to create awareness with other health professionals involved in the management of OA on the important benefits of physiotherapy in OA management. Orthopedic surgeons' referral to physiotherapy is one of the vital means through which patients can be treated in Nigeria.

## **6.8 CHALLENGES ENCOUNTERED BY HEALTH PROFESSIONALS WHEN MANAGING PATIENTS WITH OSTEOARTHRITIS**

The problems encountered by the physiotherapists are best described in three themes, namely late referral, unavailability of resources and non-adherence to treatment.

### **6.8.1 Late Referral**

Referral to a physiotherapist is one of the means through which the physiotherapist can administer treatment to patients with OA in Nigeria. However, late referral of patients with OA for conservative management has really been a challenge in OA care. Linsell et al. (2005) in the United Kingdom found that 2.4% of patients were referred to physiotherapy by their general practitioner on the first consultation, with this figure increasing to 17.7% if they again consulted within 36 months. This suggests that the referral pattern by the orthopedic surgeons still remains low. In the present study physiotherapists stated that when orthopedic surgeons finally refer patients with OA for physiotherapy management, complications like stiffness or contractures, severe pain, disabilities might have set in. This poses a great challenge for physiotherapists in effective management of patients with OA in Nigeria. Also most late referral by orthopedic surgeons for physiotherapy are made when the patients do not have enough funds for a joint replacement surgery. Porcheret et al. (2007) observed that surgical referral was initiated before more conservative interventions had been tried. In the present study, pharmacological treatment was the mainstay of management, as opposed to other forms of treatment.

### **6.8.2 Availability of Resources**

Availability of suitable resources enables physiotherapists to carry out treatment effectively. However, lack of resources including infrastructure and treatment facilities were perceived as a challenge by many participants. The physiotherapists felt lack of resources and treatment facilities could affect the outcome of management of patients with OA. Alberta (2007) reported a lack of resources as one of the many factors that is challenging to physiotherapists. In the present study the physiotherapists expressed a lack of resources on the sides of both the physiotherapists and the patients. Physiotherapy management of OA usually entails a few sessions; but patients however have difficulty with finances as treatment sessions are self-sponsored by the patient, and

not the government. Reid et al. (2014) reported cost (59%) and high pain levels (24%) as the most commonly selected barriers preventing patients from attending physiotherapy treatment. This suggests that financial support should be made available in terms of medical aid for patients with OA, as this would help to ease difficulty in finance and as well improve treatment for the patients.

### **6.8.3 Adherence to Treatment**

The physiotherapists' stated that the desired outcomes for patients with OA are sometimes interfered with due to poor adherence to treatment. Adherence is defined as "the extent to which a person's behaviour corresponds with the agreed recommendations from a healthcare provider" (WHO, 2003 p3).

#### **a) Non-adherence to Treatment**

Non-adherence to treatment is often associated with poor treatment outcomes. Under this emerging theme, the responses from the participants gave rise to various sub-themes such as: a) patients' lack of knowledge and non-compliance and motivation. In the present study the physiotherapists stated that non-adherence to treatment such as the patient's lack of knowledge which had resulted in negligence of treatment sessions. Researchers also reported a lack of public awareness concerning the role and scope of the physiotherapy profession and recommendations have been made for the need to market the profession (Webster, Holdsworth, McFadyen & Little, 2008; Igwesi-Chidobe, 2012). Therefore, it is not unreasonable for a patient to refuse treatment from a physiotherapist. Physiotherapists should inform the patient of what to expect during the assessment and treatment, including the benefits of the treatment for the patient.

## **b) Non-compliance and Lack of Motivation**

Non-compliance and lack of motivation due to emotional status definitely impedes the patient's adherence to treatment. This interferes with treatment since motivation from the patients facilitates treatment and leads to a better outcome, the participants reported that depression and pain are the major reasons for non-compliance. This is also reported by other studies, as one of the factors causing patients' non-adherence to treatment (Campbell et al., 2001; Alberta, 2007; Chan & Chan, 2010). Smith (2008) identified intrinsic and extrinsic motivators to assist in improving the adherence of the patient to rehabilitative management. Some of the intrinsic motivators include the patient's age, the condition of the patient and attitude towards exercise, while extrinsic factors include physiotherapist-patient relationship and social relationships. In addition, motivational training has also been proven useful in increasing short term adherence to home exercises (Friedrich et al., 2008).

## **6.9 CHALLENGES ENCOUNTERED BY HEALTH PROFESSIONALS WHEN MANAGING PATIENTS WITH OSTEOARTHRITIS**

The orthopedic surgeons stated that their major challenges are namely: non-compliance to medicine and cost of surgery.

### **a) Non-compliance to Medicine**

Non-compliance of patients with OA to the prescribed drug (medicine) regime was one of the challenges faced by the orthopedic surgeons. As reported by Ganz, Chang, Roth, Guan, Kamberg, Niu et al. (2006), it is evident that some of these analgesics have side-effects when administered as long term use, which can result in damage to the gastric mucosa. In the present study it is evident that most of the patients with OA seen by the orthopedic surgeons are being managed with pharmacological treatment. This suggests that the orthopedic surgeons have to be enlightened on



the various forms of OA management options.

#### **b) Cost of Surgery**

Surgery is the last option in the management of patients with OA. The orthopedic surgeons stated that the cost of surgery as being one of their major challenge for the management of patients with OA. In the present study about  $n=(75.2\%)$  of patients with OA received surgical management,  $n=1(0.8\%)$  patients with OA were walking independently, whereas 4.4% were walking with aid. This suggests that whatever the patient's functional status, it did not determine the treatment. There was a significant relationship between functional status and type of treatment. Most treatment using surgery is determined by the patient's affordability for a joint replacement. This shows that orthopedic surgeons do not appropriately utilise the other treatment options available for management of OA, such as conservative management (physiotherapy) in treatment of patients with OA. Orthopedic surgeons should consider referral for joint surgery for people with OA who experience severe joint symptoms (pain, stiffness and grossly reduced function) that have a substantial impact on their quality of life and are refractory to non-surgical treatment (NICE, 2008).

#### **6.10 SUMMARY OF THE CHAPTER**

This chapter discussed the findings of the study in line with the study objectives and with reference to other literature. Studies relating to perceptions and experiences of health professional regarding conservative management of OA were reviewed and compared with present study. Therefore, this research adds to the body of knowledgewith regard to the prevalence of OA and the perceptions of health professionals regarding conservative management of OA. The next chapter will present the summary of the study, strengths and limitations and lastly the recommendations.



## **CHAPTER SEVEN**

### **SUMMARY OF THE STUDY, LIMITATIONS AND RECOMMENDATIONS**

#### **7.1 INTRODUCTION**

The summary and the conclusion of the study are provided in this final chapter. In addition, the limitations of the study are stated. Finally, recommendations that emerged based on the findings of this study are outlined.

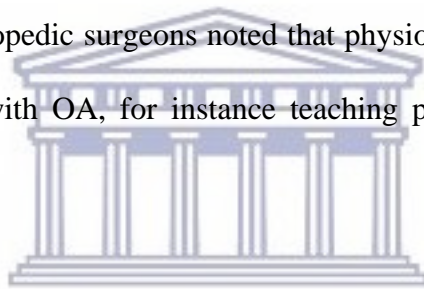
#### **7.2 SUMMARY OF THE STUDY**

The purpose of the current study was to describe the profile of patients with OA for a five-year period and to explore the perceptions and experiences of health professionals regarding the conservative management of OA at a tertiary hospital in Nigeria. A retrospective descriptive method was employed to gather data from patient folders to determine the patient profile of patients with OA for the period 2012 to 2016, including the use of conservative management (physiotherapy) of OA at a tertiary hospital in Nigeria. In addition, FGDs and interviews were employed to explore the perceptions and experiences of health professionals regarding the conservative management of OA at a tertiary hospital in Nigeria.

The results of the present study indicated that pharmacological treatment was the first choice of treatment used in management of OA, as n=102 (75.6%) of the patients were managed using medication. This was followed by conservative management n=26 (19.3%), including, for example, orthotics and physiotherapy and surgery n=7 (5.2%). The patients who received physiotherapy treatment were given interventions that included cryotherapy, therapeutic exercise, manual therapy, mobilisation and electrotherapy, balance and co-ordination,

positioning and gait training. Almost two thirds (64%) of patients with OA were walking independently while 36% made use of a walking with aid (walking stick, walking frame, crutches, and/or a wheelchair). A significant relationship was found between functional status and type of treatment received. Patients receiving pharmacological treatment were walking more independently than those not receiving medication.

The perceptions of physiotherapists were that the management of OA at their health care facility was inadequate and there is a need for improvement. On the other hand, the orthopedic surgeons reported satisfaction in the management of OA at their health care facility. In addition, physiotherapists reported assessment, treatment, health promotion and prevention as their role in OA management, while the orthopedic surgeons noted that physiotherapists are mainly involved with rehabilitation of patients with OA, for instance teaching patients exercises and postural correction.



The health professionals (physiotherapist & orthopedic surgeon) reported that the decision of whether conservative management can play a role is dependent on the severity of the condition. In mild to moderate cases of OA, conservative management can be beneficial in the management of patients with OA, whereas in severe cases surgery should be the first treatment option. Several challenges in the management of patients with OA were expressed by the health professionals. The physiotherapists reported a lack of adequate resources to treat patients, poor treatment adherence due to lack of knowledge, non-compliance and motivation, as well as financial difficulties. Orthopedic surgeons reported their major challenges to be non-compliance of patients to their drug regime and cost of surgery.

### 7.3 LIMITATIONS OF THE STUDY

The findings of the present study should be interpreted in light of the following limitations:

- Many patients' folders were missing; thus the sample size was lower than initially anticipated. Therefore generalisability of the findings is limited.
- Data in some of the patient folders were incomplete, for example, regarding the occupation of the patient, functional status, type of treatment received, modality employed, gender and age. This is of great concern as documentation on modality employed, age of the patient, functional status of the patient is necessary so as to understand the shortcomings in effective utilisation of conservative management, plan and implementation of appropriate health promotion strategies to create awareness on conservative management.
- The views of the health professionals (physiotherapist & orthopedic surgeon) involved in the management of OA could not be included in the study as the majority of them were too busy to participate in the interviews or FGDs.

### 7.4 RECOMMENDATIONS

The following recommendations are made for different stakeholders, based on the findings of the study:

#### **Health Professionals**

- Provision of workshops or talks to provide up-to-date evidence on the current practices of OA management for all in-service health practitioners. This could enhance the knowledge of health professionals regarding the most appropriate prevention and management strategies available to curb the rise of this debilitating condition.
- More awareness programmes for the general public to improve the literacy levels of the general public.

- Creation of a data base for OA specifically. This could assist with the early identification and referral of patients; thus providing appropriate management, depending on the stage of the condition.
- There is an urgent need for physiotherapists to create awareness regarding the role they can play in the management of patients with OA, especially in the non-pharmacological or conservative management of the condition. This could assist with appropriate and early referral which could assist with improvement in the quality of life of patients affected by the condition.
- In addition, special effort should be made to implement first contact physiotherapy management, in relation to musculoskeletal conditions.
- Health promotion should be included in the undergraduate curriculum as well as in the continuous training of health professionals.
- Physiotherapists as seen in Nigeria are not primary health care providers; therefore physiotherapists should be more involved in community-based rehabilitation. It is recommended that educational programmes should be developed and implemented for OA patients specifically, this will help patients and health professionals have a better understanding of the role physiotherapists play in OA management.
- Physiotherapists should aim at marketing their profession at the community level so as to increase patient adherence to treatment.

### **The Government**

The importance of strict rules and regulations regarding the following cannot be emphasised enough:

- A well-equipped rehabilitation unit for orthopedic patients should be built in all tertiary hospitals in Nigeria to reduce challenges faced by health professionals while delivering

appropriate services to patients with OA.

- Physiotherapists should be recognised as primary health care providers as this could bridge the inconsistent referral practices for conservative management by physiotherapists of orthopedic surgeons.
- Health insurance scheme should be affordable and made available for patients with OA for easy accessibility to health care.

## **7.5 CONCLUSION**

The present study investigated the perceptions and experiences of health professionals regarding conservative management of OA at a tertiary hospital in Nigeria. Pharmacological intervention was the choice of treatment mainly used by the orthopedic surgeons. Referral of patients with OA for conservative management by physiotherapists was very poor, therefore physiotherapists are not readily involved in the management of patient with OA in the early stages of the disease. This could have detrimental outcomes for the patients as it negatively affects the patient's quality of life. Health professionals involved in the management of OA should be educated on the importance of early referral to physiotherapy for OA management. This study also revealed that orthopedic surgeons have little knowledge about what physiotherapists can offer in the management of patients with OA. Awareness on the importance of conservative management should therefore be strongly advocated amongst health professionals involved in the management of OA.

## **7.6 SUMMARY OF THE CHAPTER**

The final chapter summarised the findings of the study. In addition, limitations and recommendations of the study are also given.

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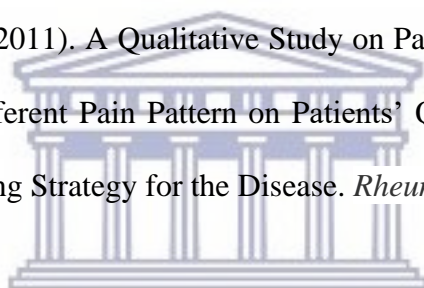


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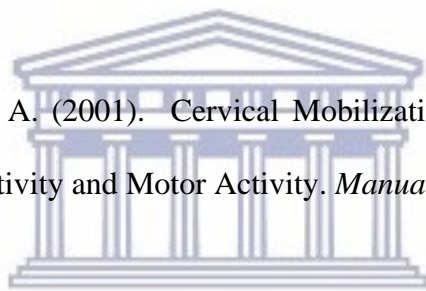


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